B I E N N I A L R E P O R T

N O R T H C A R O L I N A D E P A R T M E N T

O F A G R I C U L T U R E

From July 1, 1928

To June 30, 1930

LETTER OF TRANSMITTAL

To His Excellency, O. Max Gardner,

Governor of North Carolina:

Sir: In compliance with section 3944 of the Revisal of 1905, I submit the following report of the work of the Department of Agriculture for the years 1928 and 1930.

Respectfully,

Wm. A. Graham

Commissioner of Agriculture.

Raleigh, N.C.,

October 31,1930

OFFICIALS AND EMPLOYEES OF THE STATE

DEPARTMENT OF AGRICULTURE

STATE BOARD OF AGRICULTURE

W.A. Graham, Commissioner, Ex Officio Chairman, Raleigh

F.P. Latham,	Belhaven	First District
H.B. Foxhall,	Tarboro	Second District
W.A. Brown,	Rocky Point	Third District
Clarence Poe,	Raleigh	Fourth District
C.F. Cates,	Mebane	Fifth District
A. Ludeke,	Castle Hayne	Sixth District
J.G. Hackett,	North Wilkesboro	Seventh District
T.H. Coffey,	Blowing Rock	Eighth District
S. C. Lattimore,	Shelby	Ninth District
E.G. Roberson,	Leicester	Tenth District

OFFICERS AND EMPLOYEES

Executive Offiers

W.A. Graham	Commissioner
K.W. Barnes	Secretary and Purchasing Agent
Mrs. Carl Hill	Bookkeeper
Miss Mary Knight	Stenographer-Secretary
C.R. Warlick	Oil and Gasoline Clerk
Miss Mary Norvel	Stenographer-Clerk

Analytical Division

W.G. Haywood	Fertilizer Chemist
Z.B. Bradford	Assistant Chemist
W.B. Hendrix	Assistant Chemist
E.T. Hord	Assistant Chemist
J.S. Pittard	Assistant Chemist
H.F. Pickering	Assistant Chemist
J.C.Matthews	Assistant Chemist
L.M. Nixon	Feed Chemist
Miss M.S. Birdsong	Secretary
Mrs. J.F.Hatch	Stenographer

Museum

H.H. Brimley	Curator
Harry T. Davis	Assistant

Veterinary Division

William Moore	State Veterinarian
L.J. Faulhaber	Assistant Veterinarian

A.J. Osteen ---------- Assistant Veterinarian
P.M. Abernethy ---------- Assistant Veterinarian
H.C.Kennett ---------- Hatchery Inspector
Mrs. L.S. Harris ---------- Stenographer
T.T. Brown ---------- Assistant Veterinarian

Division of Entomology

R.W. Leiby ---------- Chief
C.S. Brimley ----------Assistant Investigations
D.L. Wray, Jr. ----------Assistant Investigations
J.A. Harris ----------Assistant Investigations
Mrs. Pauline Newsome ---------- Stenographer

Food & Oil Division

W.M. Allen ---------- State Food and Oil Chemist
L.B. Rhodes ---------- Assistant Food and Gasoline Chemist
W.A. Queen ---------- Assistant Food and Linseed Oil Chemist
J.B. Joyner ---------- Assistant Food and Linseed Oil Chemist
W.C.Hammond, Jr. ---------- Assistant Food and Linseed Oil Chemist
Miss Sarah G. Allen ----------General Clerk
Miss Pearl Koontz ----------Stenographer
McKay McKinnon ----------Inspector
J.A. Bradford ----------Inspector

Division of Botany

J.L. Burgess ---------- Botanist
J.W. Woodside ----------Assistant Botanist
Miss Susie Allen ---------- Seed Analyst
Miss Elizabeth Madden ----------Assistant Seed Analyst
Miss Kate Ballard ----------Assistant Seed Analyst
Miss Katherine McMillan ---------- Assistant Seed Analyst

Division of Markets

R.B. Etheridge ---------- Chief
C.G. Filler ---------- Marketing Specialist
L.C. Salter ----------Junior Marketing Specialist
C.W. Sheffield ---------- Marketing Specialist
A.R. Powledge ---------- Clerk
Miss Bessie Paul ---------- Stenographer- Clerk
Miss Mabel Haynes ---------- Stenographer

Warehouse Division

A.B. Fairley ---------- Superintendent
F.H. Ramseur ---------- Warehouse Examiner
C.R. Reynolds ---------- Cotton Classer
Mrs. J.N. Mason ---------- Stenographer Clerk
Miss Elizabeth Moore ---------- Stenographer

Savings and Loans Association

Miss H.M. Berry ---------- Superintendent

Division of Agricultural Economics

Frank Parker ---------- Agricultural Statistician
J.J. Morgan ---------- Assistant Statistician
Wm.H. Rhodes, Jr. ---------- Assistant Statistician
Mrs. Ella R. Simpson ---------- Filing Clerk
Mrs. Rebecca Horton ---------- Senior Statistical Clerk
Mrs. Kathrine W. Haig ---------- Collaborator Clerk
Mrs. Polk Denmark ---------- Statistical Clerk
Evelyn Peacock ---------- Clerk
Herbert Barnes ---------- -----Machinest
Miss Sadie Walker ---------- Stenographer

Publications

Wm.H. Richardson ---------- Agricultural Editor

Drainage

F.O. Bartel ---------- Engineer

Farm Forestry

H.M. Curran ---------- Farm Forestry Specialist

Test Farms

F.E. Miller ---------- Director and Horticulturist
Miss Louise Wright ---------- Stenographer
R.E. Currin, Jr. Superintendent Edgecombe Test Farm, Rocky Mount
F.T. Meacham ----------Superintendent Iredell Test Farm, Statesville
S.C. Clapp ---------- Superintendent Buncombe Test Farm, Swannanoa
Chas. Dearing ----------Superintendent Pender Test Farm, Willard
E.G. Moss ----------Superintendent Granville Test Farm, Oxford
J.L. Rea, Jr. ---------- Superintendent Washington Farm, Wenona

J.F. Hatch ----------Custodian

Dairy Work

A.K. Kerr ---------- Specialist

Inspectors

T.L. Gibson ---------- Chief Inspector
R.C. Lineback ----------Feed and Fertilizers
J.B. Yarborough ---------- Gasoline and Oil
T.J. Betts ---------- Gasoline and Oil
C.C. Jordan ---------- Gasoline and Oil
W.M. Miller ---------- Gasoline and Oil
T.J. Horner ---------- Gasoline and Oil
R.A.Hudson ---------- Gasoline and Oil
W.C. Fields ---------- Gasoline and Oil
W.E. Hooks ---------- Gasoline and Oil
R.A. Hoyle ---------- Gasoline and Oil
J.K. Harris ---------- Gasoline and Oil

Agriculture has not escaped the ill-effects of the nationwide depression, which has taken its toll from practically every line of business. Industry has also suffered, but it was better prepared to meet the situation, due largely to the fact that for many years the manufacturers of the country have been far-sighted enough to keep well organized. Therefore, when the collapse came, industry was able to take stock of itself more accurately and to intelligently retrench to the point where it could stand its losses to better advantage, but this did not relieve the situation because the lower wages now paid and the fact that so many people are idle mean that many who could formerly afford more than the necessities of life are now in a position where they cannot provide themselves with the commodities produced on the farm. Consequently, there has arisen a decreased demand and many cannot afford to buy at any price. At the same time, expenses incident to farming have not decreased; taxes must still be paid, if farm land is to be retained by the owners, and where there are mortgages, these must be met, else foreclosures will result. This combination of circumstances has worked a great hardship on our agricultural population, which was not responsible for bringing the depression about but must suffer its consequences to a distressing degree.

It is to be hoped that relief will come, but in order for this to be the case there must be concerted effort, and the activities of those who seek to bring about improved agricultural conditions must be nationwide. As helpful as local endeavor may be, it cannot cure a malady that extends throughout the United States. For this reason, the need for wise national leadership has become more apparent. Whatever form of relief is adopted, it must not be too complicated, and the conditions of accpetance must not be too drastic, because the farmer is not now in a position to await the unwinding of red tape. Local endeavor is extremely important but this, within itself, will not bring about the desired result; it must be coupled with efforts of a more far-reaching scope, if agriculture is to recoup its losses to any appreciable degree.

I do not believe North Carolina has been delinquent in its duty toward the farmer; obstacles have been many but there has been a sincere effort to help those whose living depends upon tilling the soil and marketing crops. There are many reminders that the farmers of this State are better off than those in some of the other sections of the country where handicaps have been of a much more serious nature. This is especially true concerning the drought-stricken areas, where crops have been completely wiped out, including this winter's feed for livestock. In parts of our own State the unprecedented drought did much damage, but we were very fortunate in that this condition obtained in only a part of North Carolina. It is true that we have by no means reached the coveted goal, but the trend in the direction of real diversification has already demonstrated the merits of this policy, which is undoubtedly the most formidable safeguard against agricultural poverty in times of unforseen adversity. The farmer who declines to depend upon any one or two crops but who practices diversification and at the same time raises his own food and feedstuff can nearly always weather the storm; it is quite certain that he can ward off starvation and keep from going down in utter defeat.

In order for agriculture to be truly prosperous, the farmer must not only produce, but there must be a demand for his products and he must be afforded the proper facilities to meet such a demand. He must be able to

sell at a profit, and when prices fall below that level his business is endangered, because profit is the incentive that prompts all human endeavor; without it there can be no business of any nature. A striking example of this is found in the 1930 census figures which show that all over the United States farms have been abandoned by the tens of thousands. This was not due solely to the fact that farmers wanted to leave the country and move to the towns and cities, but in a large measure to the fact that there was no longer a living on the farm.

I have no complete remedy to offer, but I am constrained to stress two points which I believe should be incorporated into the curative program. In the first place, there must be a sympathetic attitude toward the farmer, and he must be accorded his rightful rating as a business man whose calling is fundamental; and, in the next place, the farmer must recognize the value of thorough organization which shall find expression not only in cooperative selling but cooperative planting. The well managed industrial plant always avoids over-production, no matter how favorable market conditions happen to be, because it is a recognized fact that supply and demand must maintain a balance as nearly even as possible. Here is where diversification will play its leading part, for diversified crops are a constant protection and stimulate the market. If those who consume raw materials are convinced that the farmers have only one commodity to sell and have produced this commodity in super-abundance, they are at least confronted with the temptation to secure that commodity as cheaply a s possible, but if they know there are other crops to fall back on and farmers can, therefore, hold the crop of which there is a surplus, this temptation will be largely removed.

I will not undertake to lay down any definite legislative program, but I do venture the hope that in their efforts to help the farmer, our assemblymen will take due cognizance of the fact that land is now bearing a disproportionate tax burden and be governed accordingly. Corrective measures will command the combined thought of all the members of the Legislature. I am not pleading the farmer's cause to the detriment of any other class, but I do contend that his interests in this matter of taxation should command a very prominent place in whatever legislative program is adopted. I would not cripple industry, because I know that it affords a market for the farmer's raw materials; at the same time, the farmer should be given full recognition and, if possible, his taxes should be materially reduced, in order that he may meet his obligations more adequately and avoid having his land sold at public auction. Hundreds of farms have gone that way during this summer and fall and it is highly necessary that adequate steps be taken to prevent a recurrence of this situation. Continued abandonment of farms, no matter from what cause, will constitute a drain on the economic world which will be far-reaching in its ill-effects.

There must not only be cooperation within the State but with the producers living in neighboring States, if marketing conditions are to be entirely satisfactory. It was my privilege during the past summer to participate in the calling of a conference in the city of Atlanta, to consider marketing needs from a southwide standpoint and if possible to secure some form of cooperation that would establish uniformity in selling. The most feasible plan was that our Southern growers, especially of fruits and vegetables, form a cooperative organization designed to promote proper distribution on the markets of the north and east, thereby eliminating much of the useless and harmful competition which now exists. Representatives from the various

States thought well of this plan, and I was appointed on a committee to present the matter to the Federal Farm Board, with a view to securing the cooperation of that body. I have already discussed the matter with members of the Farm Board and I hope the principle involved will form the basis of a system that will be worked out in the near future. Under the proposed arrangement, shipments to outside markets would be diverted when necessary and shippers would be kept informed at all times as to the existing demands in consuming and distribution centers.

One of the most discouraging features of the 1930 season has been the low price of tobacco, which appeared to be general throughout the southern belt. The Georgia crop brought practically nothing and when the North Carolina markets opened, the same condition prevailed. An upward trend was apparent as the market advanced, but even the maximum prices were highly unsatisfactory and below those realized in previous years. This matter was the subject of much discussion and remedial measures were considered. I sincerely hope that some plan can be worked out whereby better prices can be obtained in the future. There has been no decline in the price of manufactured tobacco to the consumer; the excessive federal tax on types raised in North Carolina continued in force and all the manufacturers, which are spending vast sums for advertising, claim that cigarette sales are increasing in leaps and bounds, since the practice of smoking has become almost iniversal. The difference in the cost of the raw material and that of the finished product remains puzzling.

The Department of Agriculture, through its fourteen divisions, has rendered the farmers of the State every possible assistance during the past biennium. This Department was created by the Constitution for the special benefit of those who earn their living from the soil, and in its recognition of the duties imposed upon it the interests of the farmer come first. Reports of the various divisions which follow show that much progress has been made during the past two years.

Members of the State Board of Agriculture whose terms expire during the 1931 sitting of the General Assembly are: F.P. Latham, of the First District; Clarence Poe, of the Fourth District; J.G. Hackett, of the Seventh District, and E. Grover Robeson, of the Tenth District.

Following will be found ashort synopsis of the work done in the fourteen different divisions of the Department of Agriculture.

Market Division

The work of the Market Division is carried on, to some extent, in cooperation with the Federal Bureau of Agricultural Economics. The inspection of carlot shipments of fruits and vegetables is the leading function of the Market Division. During the past two years this Division has inspected 11,392 carlots of fruits and vegetables. This has all been shipping point inspection. A good deal of terminal inspection has been done throughout the State. During the shipping season a daily Market News Letter is issued giving the shippers information as to prices of carlots shipped each day. Assistance is given in the standardization of packages containing fruits and vegetables and, in September, 1929, tobacco grading was started in the State under the supervision of members of the Market Division.

This Division has been largely instrumental in developing the poul-

try industry in this State. For the years 1929-1930 there were shipped from this State to northern markets over ten million pounds of live poultry, valued at $2,448,000. This work has been far reaching, having served the farmers in practically 90 percent of the counties in the State, and during these two years 175,000 farmers have patronized these sales.

Much work has been done in the preservation of eggs through cold storage, and we are convinced that much good is going to come of our efforts.

We are developing a market for wool for the benefit of the sheep industry in the western part of the State. During the past year 396 farmers in ten of the western counties delivered 37,965 pounds of wool, on which the Farm Board advanced twenty cents.

This Division also assists in marketing live stock and is helping extend the market for cattle and hogs as rapidly as possible.

We have worked out a plan with the Federal Bureau of Economics whereby information concerning carlot shipments of fruits and vegetables, together with prices received for same, is disseminated daily over radio. This additional news service is being well received and we have every reason to expect great good to come to our growers as a result of this effort.

Botany Division

The Botany Division is charged with the examination of the various field and garden seeds. During the last two years there has been examined and tested in the Seed Laboratory 6,982 different samples. The tobacco farmers of the State sent in tobacco seed to be recleaned and treated. During the last two years there has been recleaned and treated in the Seed Laboratory 1,466 pounds of tobacco seed for 834 different farmers.

This Division distributes nitro cultures for legume crops, and has been engaged in this line of work for a number of years.

The grading of grains is also done in the Seed Laboratory, and this service has greatly improved the quality of grains shipped into this State for milling and feeding purposes.

The last Legislature enacted a Certified Seed Law and directed the Botany Division of the Department of Agriculture to cooperate with the field forces of the College in securing for the farmers of the State certified seed for field crops. The enactment of this law has added a good deal to the work of the Botany Division.

Veterinary Division

While contagious diseases among animals, such as tuberculosis and hog cholera and fever tick have for sometime been considered eradicated from the State, still much caution has to be exercised in order to keep the livestock of the State free from becoming re-infested.

The Veterinary Division is always on the lookout for insipient reinfection and, through such precaution, we hope to keep the State in a sanitary condition in respect to its live stock industry.

Much work has been done during the past two years in the suppression of hog cholera and in the control of swine parasites. Other forms of disease among hogs have been studied, such as pneumonia and other internal disorders.

The Veterinary Division cooperates with the State College in its poultry work in administering the blood test. During the past season a total of 279 flocks, comprising over 43,000 birds, were tested.

Analytical Division

The Analytical Division is charged with the examination of fertilizers, feeds, insecticides and other miscellaneous work. During the past two years this Division has been kept very busy and has been able to do 9,519 different samples sent in by inspectors, dealers, farmers and others.

One of the leading questions is that concerning the use of chlorine in tobacco fertilizers. Considerable interest has been taken in this problem quite recently. It has been found that a small amount of chlorine in tobacco fertilizer increases the value of the crop, but that any amount in excess of two per cent is considered dangerous. In the future all tobacco fertilizers will be examined carefully in order to ascertain the exact per cent of chlorine contained in the different potash carriers going into the fertilizer mixture.

Entomology Division

The Division of Entomology is charged with the control work pertaining to insects and diseases that affect man, plants, and animals. The fruit industry of the State is directly dependent upon freedom from insects and various fungous diseases, and our Entomology Division looks after the nurseries and tries to prevent infected nursery stock from being sold into our leading fruit producing areas as well as to individual farmers who must grow fruits for home consumption. This work has progressed very satisfactorily during the past two years. During the past two years, out of a total of 181 nurseries one-hundred forty one have been certified, and the remainder will be certified upon payment of the inspection fee. This speaks well for the success of this line of inspection work, which covers an area of 1,525 acres planted to nurseries of fruit and ornamental trees.

An insect survey of North Carolina was begun by this Division in 1902. To date, a total of 8,234 species are known to occur in North Carolina.

In addition to the fruit tree inspection work of this division, its operations extend to the inspection of various fruits and vegetables where insect life is likely to be found developed in destructive quantities.

The Mediterranean fruit fly that appeared in Florida sometime ago gave this division much concern, but today we are glad to be free of danger of this pest in this State; at any rate, the quarantine against fruit coming in from Florida has been lifted.

Test Farms

The six different test farms of the State are conducted cooperatively by the State College of Agriculture and the State Department of Agriculture. The work of the farms is planned jointly by the College and the Department.

There are 181 experimental projects in process at this time. The Federal Department of Agriculture has an interest in some of these projects.

A day is set apart each year as a field day at each of these local experiment stations. On these days suitable speakers are secured and everybody in the section where the farm is located is supposed to attend and, as a rule, does attend. The experiments are examined and explained by the men in charge, and the farmers appear to get much first-hand information which they can apply in their own farm practice in the communities where these farms are located.

These farms serve as sources of information to be used in particular by the extension forces of the College in their work among the people throughout the State. Each farm is so located as to study problems of special interest to that particular part of the State and experiments are conducted with crops and fertilizers that are peculiar to the section in which these farms are operated. Experiments in livestock, including cattle, swine, and poultry, are conducted at these stations along with the experiments relating to crops.

Museum

During the past two years a number of additions have been made to the collections in the State Museum. It is no little surprise to a native North Carolinian to find that this country was inhabited by the elephant, the mastodon, the buffalo, and other animals now found only in far distant regions. Two whale skeletons have been mounted within the last biennium and are now on exhinition on the second floor of the Museum building.

Special attention is hereby called to determination of geological specimens sent in from time to time from various parts of the State. The mineral exhibit of the museum is of unusual interest. Many accessions have been made during the past two years, and it will pay any one to examine and study them. A great many people visit our State Museum. The last two years will show that the number will reach nearly the two hundred thousand mark during that time. Some four-hundred different school classes come to study the exhibits. The Museum is an educational institution within itself.

Forestry

Our forester, Mr. Curran, is now on leave of absence, doing work in the University of Manila, Phillipine Islands. During his absence, the work of this division has been divided up among the various other divisions and departments that are variously equipped to do this line of forestry work.

State Warehouses

During the year 1929 there were forty-six warehouses licensed to do business in this State. In 1930 there were fifty-two. During the two years these warehouses altogether took care of 376,000 bales of cotton, or about one-third of the crop of the entire state. The services of a Federal cotton classer has been obtained to classify any cotton of any farmer who chooses to place it in one of these houses. A financial statement covering the state warehouse operations will be found in the report

Publications

The Division of Publications is charged with giving out such in-

formation as the Department feels will be worth while to the people of the State. Various bulletins are published from time to time that have special bearings on special subjects of inter est to the schools as well as to the individual farmers. Such information is sent out by the Chief of this Division, who also co-operates with all other divisions of the Department in geting results from their work before the public. This is done by means of the press, department publications, and ~~exer~~ broadcasting over the radio. In short, the Division of Publications is the publicity division of the State.

Savings and Loans.

The law establishing the Savings and Loans Association was placed in the hands of the Department of Agriculture. The Association was organized and supervised by members of this Department, the objective being to encourage small local bodies of men and women to join themselves together to pool their funds and organize what amounts to a miniature banking institution from which they can borrow money at a fixed rate and to which they loan money at a fixed rate. This movement has been quite successful and bids fair to become very popular among the farmers and working people who do not have very much money at any one time, but who do occasionally have to negotiate small loans for a short period of time.

Dairy Division

The Dairy Division was created in this Department at the urgent request of the dairy interests of the State. The Chief of this Division is charged with the looking after of various creameries, cheese plants, and other milk consuming and distributing agencies.

Food and Oil Division

The object of this Division is to protect the health, life and financial interests of the people of the State in the purchase of foods, beverages, oils, gasoline, etc. Since the passage of our food inspection law, great improvements have been made in sanitary conditions in our food manufacturing plants.

As is well known, tremendous expenditures are made for oil and gasoline and hundreds of thousands of dollars could be lost in a day by allowing low grade products to come on the market. This phase of inspection work of this Division is, therefore, of the utmost importance. Some idea of the work of this Division may be made from the 30,941 samples inspected and examined during the past biennium.

Statistics.

The Statistical Division may be called the farmers' bookkeeping department of the State. This Division keeps tract of the acreage, the plantings, the production, the prices, and the balance of crops left over from the previous year. It is through the operations of this Division that we are enabled to learn just where we stand from year to year as a crop producing State. One will see, therefore, that the work of this Division is basic and fundamental to our agricultural crops.

Weights and Measures

The last Legislature abolished the fee system and put a tax on certain weights and measures equipment with aview of financing the work. The Attorney General held that this law,although passed as a separate act,was a part of the Revenue Law, and that the Revenue Department would have to collect this tax. The funds received from this source have been far short of expectations, with the result that this Division has been able to operate in only a limited way.

DIVISION OF TEST FARMS.

Sir:-

I take pleasure in submitting this Biennial Report of the Test Farm Division covering the fiscal year 1929-1930. In this report special emphasis will be given to the present program, with progress reports on some of the more outstanding projects at each of the six Test Farms. More detailed information on the various projects has appeared from time to time in bulletins and circulars published by the Department and State College, in the agricultural press, and in the newspapers of the State.

COOPERATION.

The Test Farms are endeavoring to cooperate with all agencies interested in the development of agriculture in North Carolina. The present program which includes 181 definite experimental projects is handled in cooperation with the Agricultural Experiment Station of the N. C. State College, and in some instances with the U. S. Department of Agriculture, We have also worked on certain projects in cooperation with such other agencies as the State Extension Service, the State Vocational Agricultural Service, Commercial fertilizer companies and other business and civic organizations. This cooperative arrangement has been very satisfactory. It has made possible an enlarged program of work, and has enabled the stations to render greater amount of service to the agricultural interest of the State.

PUBLIC RELATIONS.

The past biennial period has been the most important of any similar period in the history of the Test Farm organization. With the general depression in business conditions which includes agriculture, there has been a great demand on the stations for information on better methods of farming, than in any previous years. At no time in the history of the stations has the correspondence work been so great. The superintendents have also devoted considerable time and effort during the period to the making of public addresses. These relate especially to such subjects as the Governor's Live-At-Home program, livestock and pasture development, and the improved methods of growing different crops.

An important feature of the Stations' activities has been the work of dealing with visitors. This has included not only the visits of individuals, but the visits of groups of various sizes. The stations have become so firmly established as centers of agriculturel information in the respective sections that there is not a day but what there are visitors from different farms and others desiring information or service of some type. It is estimated that 50,000 people visited the farms during the past year.

The stations have continued to conduct special days or schools for the purpose of bringing together farmers and others interested in particular subjects. These are in the nature of institutes for the study of special and timely subjects. The meetings of the past period have dealt with such subjects as poultry, strawberries, pastures, legume and forage crops, tobacco, peanuts, dairying, beef cattle, etc.

The most important day at each of the six stations is the Annual Farmers Field Day. This year there was an attendance of approximately 18000 people at five of the Field Days. The annual meeting of the Piedmont Station was cancelled owing to the death of Assistant Director Frank T. Meacham. These events have become fixed institutions in the agricultural life of the State, and are one of the best means of giving the public the benefit of many experiments underway.

The Test Farm organization has suffered a great loss in the death of Frank T. Meacham on May 17, 1930. Mr. Meacham started the work at the Piedmont Station in 1903, and remained in charge until his death. He was one of the pioneers in experiment station work in this state, and was a real factor in the development of the agricultural life of the Piedmont section. We have lost a real friend and an able co-worker.

COASTAL PLAIN STATION - WILLARD, N. C.

Chas. T. Dearing, Ass't Director in Charge.

Station established in 1905; Soil type, Norfolk fine sandy loam; Area of farm, 273 acres; Elevation, 51 feet above sea level; Mean annual temperature 62.1 degrees Fahr.: Annual rainfall, 50.86 inches.

The following is a summary of work conducted at the Coastal Plain Station with brief statements of results obtained:

AGRONOMY PROJECTS.

1. Soil Fertility Investigations in cooperation with N. C. Experiment Station. The tests show that a complete fertilizer containing nitrogen, phosphoric acid and potash is essential under the Norfolk fine sandy loam soil of this Station. Lime has been found to decidedly increase the yield of both corn and soybeans, while for oats and vetch its use has not been profitable. The use of lime on soybeans has also been associated with chlorosis which has been shown to be due to a deficiency of manganese.

2. Soil Type Investigations. This work in cooperation with the N. C. Experiment Station dovetails with similar tests being conducted at the other Test Farms, and is for the purpose of comparing the fertilizer requirements of the various soil types of the State.

3. Study of Manganese Deficiency in the Soil in cooperation with the N. C. Experiment Station. It has been found that in fields of the Norfolk fine sandy loam there are areas which show a chlorosis which can be corrected by the use of manganese sulphate. This experiment is for the purpose of showing that excessive applications of lime under this type of soil may render manganese insoluble, thus developing chlorosis due to manganese deficiency. An outgrowth of the manganese studies at this station is the scientific paper recently published by Dr. H. B. Mann of the N. C. Experiment Station, entitled, "Availability of Manganese and of Iron as Effected by Applications of Calcium and Magnesium Carbonates to the Soil." The information developed regarding manganese in the soils of Eastern North Carolina is one of the most fundamental results along the lines of soil fertility developed in years from the standpoint of practical application to farming in the section.

4. Soybean Investigations. During the period the tests of soybean varieties have been continued in cooperation with the N. C. Experiment Station and the U. S. Department of Agriculture, and the tests have been enlarged to include new types resulting from Government breeding work and Government exploration work. These tests indicate that Herman is the best variety for early hog feeding, Tokyo for mid-season and Biloxi for late hog feed-

For hay Virginia is the best as a quick maturing variety and Otootan as a variety requiring full season where land is available. Of the new varieties one of the importations by Dorsett from China is showing up especially well and may replace Tokyo as the best all around all purpose variety.

5. Crotolaria Test. In cooperation with the N. C. Experiment Station and the U. S. Department of Agriculture. Tests of a nymver of types of crotolaria are underway with the view of studying the value of this type of plant for soil improvement, livestock feed, etc. Two years tests indicate that certain types of crotolaria will be of value to the agriculture of Eastern Carolina.

6. Lespedeza Tests. In cooperation with the N. C. Experiment Station. One year's test of four types of lespedeza has shown the Kobe to yield the most hay and Korean the least. Tennessee No. 76 ranked next to Kobe and Common Lespedeza third. A yield of 2840 pounds of hay per acre from the Kobe was secured in 1930 under drought conditions. Tennessee No. 76 yielded 2532 pounds, Common 1400 pounds and Korean 1413 pounds. The Korean contained crab grass accounting for part of its yield weight.

7. Corn Variety Tests in cooperation with the N. C. Experiment Station. These tests have shown clearly the need for breeding and selection work with corn under Eastern Carolina conditions. In the past attention has been given more to cotton than to corn. In the future on account of the boll-wevil, corn will be the more important crop apparently in South-eastern North Carolina. The test conducted by the Station comparing yellow and white corns has shown clearly the need of producing a variety of yellow corn for feed purposes which will be equally productive with the best white corns now grown.

8. Corn Selection Work. In cooperation with the N. C. Experiment Station, the Cockes Prolific corn is being grown and selected with a view of securing a high production strain.

9. Corn and Soybean Planting Tests. In cooperation with the N. C. Experiment Station a study is being made of planting methods for corn and soybeans comparing the two crops planted separately, planted in alternate rows and planted in the same row. While this test has been made in a number of other states with unanimous results favorable to planting soybeans in the same row with corn, there seems to be sufficient diversity of opinion in this section to warrant a demonstration.

10. Winter Legumes . In cooperation with the N. C. Experiment Station, tests are being conducted of the various legumes suitable for growing during the winter in South-eastern North Carolina. This test includes such crops as Austrian Winter peas, Vetch, Crimson clover, etc. for the purpose of determining the relative merits and uses of these crops.

11. Grain Crop Tests. In cooperation with the N. C. Experiment Station tests of grain crops planted in the autumn and planted in the spring are being made with a view to determining the best grains to grow and the best times to plant. This test is especially designed to throw light upon what varieties will withstand winter conditions as there is much lossage from winter killing of oats, especially in this section.

12. Value of Special Grasses and Legumes under Southeastern North Carolina Conditions. The Station is conducting a number of miscellaneous tests of special grasses and legumes with a view to determining their value for pasture and lawn uses in this section. At the present time special attention is being given to White Dutch Clover as a winter pasture legume and Centipede grass.

13. Pasture Development in Eastern North Carolina. The Station is conducting its work in developing pastures under Eastern North Carolina conditions. This work has resulted in turning land which was considered worthless ten years ago into profitable pasture estimated to be giving returns of at least $50.00 per acre as grazing land for dairy cows.

ANIMAL INDUSTRY PROJECTS

Dairy Investigations in Cooperation with State Experiment Station.

14. Use of Fly Repellants in Maintaining Summer Milk Production.

15. Herd Development with Special Reference to Improvement from use of Better Sires.

16. Cost of Maintaining the Herd Sire.

17. Farm Dairy Refrigeration Studies with Special Reference to Initial Cost, Cost of Operation and Up-keep.

18. Study of Feeding Rations with a View of Determining Best Usage of Home Grown Feeds.

Results from the dairy investigations are being reported through the State Experiment Station. The investigations are conducted and financed at the Coastal Plain Station.

Poultry Investigations in Cooperation with State Experiment Station.

19. The Influence of Meat Meal versus Milk on the Production and Health of Poultry. This test has shown that while meat meal is the cheaper food, milk has given the best results from the standpoint of health of the flock and production.

20. Effects of Sulphur in Poultry Feed. This test has

failed to show the value of sulphur as an added feeding element.

21. Effects of Cod Liver Oil on Growth and Health of Poultry. This test has clearly shown the value of Cod Liver Oil from the standpoint of the health of the poultry flock and as a corrective food for ailing birds.

22. Cost of Putting Poultry into Laying.

23. Commercial Broiler Production, Costs and Returns.

24. Crate Fattening Tests of Broilers, Costs and Returns.

25. Testing Efficiency and Practicability of Electrical Brooding and Incubating under South-eastern North Carolina Conditions. The use of electrical equipment as practiced has been found to be highly profitable. The average per cent chickens hatched, for example, having increased over 20% and the quality of chickens hatched is much superior.

Swine Investigations in Cooperation with State Experiment Station.

26. Cost of Raising Pigs to Weaning Age.

27. The Family Sow, Cost and Maintenance and Returns. This swine work is maintained as a small project in order that it will not compete with the dairy investigations of the Station for feed supplies, but it is furnishing valuable information relating to the maintenance of swine as part of live-at-home program.

28. Sheep Investigations in Cooperation with the State Experiment Station. A small sheep project has been started with a view to the conduct of a small flock as a branch of diversified farming under South-eastern Carolina conditions. During the past season a flock consisting of five ewes and a ram has been increased by three ewes and returns have been received from the sale of wool and four lambs, the lambs giving a gross return of $40.00 and the wool $13.00.

29. Corn Root Worm Investigations. This is an entomological project in cooperation with the State Experiment Station and has shown the importance of rotation in controlling the corn root worm.

30. Forestry Management Demonstrations. This project conducted by the Station relates to the handling of the woodlands on the average farm and is serving to demonstrate the importance of proper management of these woodlands as a part of diversified farming. Thinning operations are being conducted and the timber removed is being utilized on the Station as fence posts, vineyard posts, fuel stakes, etc. At the same time a very beautiful and very fine forest is being developed as a demonstration.

40. Hardy Chrysanthemum Tests. The Station is testing 150 varieties of hardy outdoor Chrysanthemums resulting from Government breeding work with a view to selecting the best ones for South-eastern North Carolina and introducing these into the home flower gardens of the section.

41. Tests of Miscellaneous Plants and Varieties of Possible Value. The Station is maintaining a trial area in order to test all types of plants sent to the Station, or secured, with a view to determining their adaptability to Eastern North Carolina conditions, especially new and strange type plants introduced from foreign countries or considered appropriate for this area.

Dewberry Investigations. The Station is conducting investigations with the Young dewberry for the purpose of:

42. Determining the best Methods of Pruning and Training the Young Dewberry. By training the vines on the modified Munson trellis in contrast to the standard stake training, yields have been greatly increased.

43. Introducing the Young Dewberry as a Home Fruit for Eastern North Carolina. The Station is propagating plants and distributing same in the hope of getting this very excellent small fruit in the home gardens of Eastern North Carolina, as it is one of the finest fruits for home uses. Many thousands of plants have been set out during the past two years.

44. Development of a Thornless Type of the Young Dewberry. The Station has selected out plants of the Young dewberry which are thornless and is propagating these in the hope of securing plants which while thornless will still yield the typical high quality fruit of the Young variety in abundance.

45. Lucretia Dewberry Pruning and Culture Tests are being Conducted in Cooperation with the State Experiment Station. These tests are for the purpose of developing better methods for the handling of the Lucretia dewberry in commercial fields of the State. We hope by pruning to control some of the diseases which attack the canes and in these may effect the fruit crop.

46. Irish Potato Fertilizer and Cultural Studies. In Cooperation with the State Experiment Station. These are conducted with a view to determining best methods for the culture of this important truck crop.

47. Irish Potato Breeding Investigations in cooperation with the Horticultural Branch of the State Experiment Station and the U. S. Department of Agriculture were started last year.

48. Truck Crop Fertilizer Studies. In cooperation with the State Experiment Station during the past two years a new project relating to truck crop fertilizers has been started. The work so far has been in the nature of determining the soil conditions in the various plots of the test preliminary to the making of regular applications of fertilizer.

Sweet Potato Investigations in Cooperation with the State Experiment Station.

49. The Effect of Different Cultural Practices on the Yield and Quality of Sweet Potatoes. Results indicate that spacing twelve to fifteen inches in the row is proper, close spacing tending to increase number of culls and wide spacing favoring the formation of jumbos.

50. Sweet Potato Storage Studies. It has been found that by digging potatoes before frost instead of after frost, as is the general practice, that the percent loss in storage from rot can be reduced from about 45% to about 50%.

51. Seed Selection of Seed Potatoes. By hill and tuber selection, a strain of the Porto Rico has been developed by careful selection that has shown from twenty to thirty-five percent greater yields than common seed stock, and the appearance of the potatoes is more uniform. Similar strain of the Nancy Hall has been produced and these selected strains have been distributed to growers throughout the State.

52. Fertilizer Requirements for Sweet Potatoes on Norfolk Fine Sandy Loam Soil. Fertilizer applications have indicated that an 8-3-4 fertilizer (P N K) is proper. No increased yields from the use of excess potash have been secured, though increased yields have resulted from the use of excess potash at the Upper Coastal Plain Station.

53. Pecan Investigations. In cooperation with the State Experiment Station a pecan orchard containing all the leading varieties is being conducted with a view to getting records on the yields and other characters of the different varieties over a period of years. Also seedlings have been produced, and are being tested in the hope that some new variety of merit will be secured.

54. Lettuce Investigations. In cooperation with the Horticultural Department of the State Experiment Station comprehensive studies are underway relating to the lettuce tip burn, a serious pest to the lettuce industry of the Eastern part of the State. Having failed to develop successful methods of coping with this disease, the Station is now working along the lines of producing resistant strains of high quality lettuce for introduction to the truck growers.

55. Apple Breeding and Testing. The Station is in cooperation with the State Experiment Station with a view of producing new varieties of apples, especially apples which will thrive under the moist, humid, hot conditions of Eastern North Carolina. Tests of varieties already in existence have failed to develop a good commercial early variety, thus indicating the need of breeding work.

56. Cucumber Tests. In cooperation with the State Experiment Station a number of the new varieties and types of cucumbers have been grown to test their value for commercial culture in lieu of varieties now grown.

57. Pyrethia Tests. Tests have been made during the past two years in cooperation with the Horticultural Dopartment of the Experiment Station relating to the production of pyrethian powder from a practical daisy which serves as a basis for this industry. It is doubtful whether the powder produced under our conditions will be sufficient strong but the test is being made.

58. Cantaloupe and Watermelon Variety Tests. In cooperation with the Horticultural Department of the State Experiment Station, tests are being made of new varieties of watermelons and cantaloupes to determine their possible value as commercial varities in the section.

59. Blueberry Investigations. In cooperation with the U. S. Department of Agriculture, the Station is conducting investigations relating to the development and culture of the native huckleberry or blueberry as a cultivated commercial crop. Propagation studies have developed new information as to the methods of rooting blueberries. Studies have been made of the soils of the section and localities from the standpoint of blue berry adaptability, and several test plantings have been made at the Station and in its vicinity. This work has already resulted in bringing to the section blueberry growers from Michigan and New Jersey who will serve as leaders in the general development of this new industry.

60. Muscadine Grape Investigations. In cooperation with the U. S. Department of Agriculture, the Station has continued its work relating to Muscadine grape breeding, Muscadine grape utilization, Muscadine grape pruning, Muscadine grape fertilization, Muscadine grape culture and Muscadine grape propagation. Up to the present time the Station has never had a crop failure with Muscadine grapes and has never sprayed for any disease or insect enemy. A standard Muscadine grape juice has been developed and is being sold regularly from the Station with a view to demonstrate its merit and stimulate interest in this most distinctive Southern beverage.

61. Bulb Investigations. In support of the bulb industry in South-eastern North Carolina, the Station in cooperation with the U. S. Department of Agriculture is studying bulbs. Tests of over one hundred varieties to determine those best suited for the section are underway. Narcissus bulb storage and cultural investigations are being conducted. Iris storage and cultural tests are being conducted. Minor tests of miscellaneous bulbs are being made to determine their adaptability. The Station has conducted a commercial bulb growing project and proven the practicability of bulb culture in the section under commercial

conditions as they have existed during the last few years.

62. Bulb Disease Control. In cooperation with the U. S. Department of Agriculture, this Station is studying methods of controlling diseases of bulbs by the use of chemical treatments. This work has developed important information relating to the control of storage rot on both Narcissus and Iris and the results have been put into practice by bulb growers of the section.

Small Fruit Investigations in Cooperation with the U. S. Department of Agriculture.

63. Production of Raspberry Varieties Adapted to the South. Comprehensive breeding work is underway crossing the choice raspberries adapted to the Northern parts of the United States with certain vigorous Asiatic types which thrive under warmer climates in the hope of producing raspberries for the South. At the present time about four thousand seedlings are under test.

64. Blackberry Breeding Work. This breeding work aims at the production of blackberry varieties adapted to the conditions of South-eastern North Carolina. At the present time the Station is preparing to multiply and introduce the Brainard and perhaps other varieties resulting from this work.

65. Dewberry Breeding Work. Seedlings of the Young variety are being produced and studied in the hope of producing a variety having the choice fruit qualities of the Young along with better firmness.

66. Strawberry Investigations. This project is for the purpose of supporting the important strawberry industry of South-eastern North Carolina. The investigations take several lines. The effect of fertilizer on firmness and other characters of the strawberry is being studied in connection with comprehensive fertilizer tests. Comprehensive strawberry breeding operations are underway. During the past year over twenty thousand kinds of seedling strawberries were observed, studied and selected and additional seedlings produced for study in the future. As a result of previous breeding work, the Station was able to introduce last spring the Blakemore, a new variety of strawberry which is considered by many to have virtually saved the strawberry industry of South-eastern North Carolina due to the fact that it revived the interest of strawberry buyers in the section. The Blakemore is an exceptional variety because of its great vigor, productiveness, firmness, fine shape and color and its acid and pectin content as well as its general quality and other good characters. The Station has multiplied by propagating its stock of this variety and during the past season distributed over one-half million plants, the majority of which went to growers in the immediate strawberry districts, other plants going into practically every State of the Union, and to certain foreign countries. In addition to the Blakemore, the Station is now in position to introduce also the Southland

and Bellmar, new varieties for the home garden.

From the above list it will be seen that the program of work at this Station is quite diversified and has bearing upon practically every phase of agricultural activity of South-eastern North Carolina. It is believed that the Station is rapidly being recognized as the clearing house for agricultural information for South-eastern North Carolina, and as such the importance of maintaining the efficiency of the Station by providing needed land areas and sufficient labor and staff facilities to cope with the increasing amount of work is a matter of great importance.

IMPROVEMENTS.

During the period a number of improvements have been added, of which might be mentioned the erection of a modern fence around all pastures, removal of remaining stumps from cultivated areas, erection of a modern sheep barn, addition of twenty-five acres of land to the Station and the improvement of this area and planting same to crops, erection of two new poultry houses and one tenant house, improving property by landscape work including the planting of shrubbery and making of lawns and repairs to other buildings, additions to tile drainage system and improvement of roads on Station property, addition of bulb storage cellars and establishment of a power line.

BLACKLAND STATION - WENONA, N. C.

J. L. Rea, Jr., Ass't Director in Charge.

Station established in 1912; Soil type, peat and muck; Area of Farm, 200 acres; Elevation, 18 feet above sea level; Mean annual temperature, 59.5°Fhr.; Annual rainfall, 55.05 inches.

In addition to the 200 acres owned by the Department, the Station is renting 60 acres of land for the production of feed for the extensive livestock experiments and 160 acres of reed land adjacent to the Station are used annually for grazing beef cattle.

The following will give a brief summary of the twenty definite experimental projects being conducted at this station. These deal principally with hogs, beef cattle, pastures and fertilizer and lime studies with such crops as corn, soybeans, oats and Irish potatoes.

AGRONOMY.

Experiments handled in cooperation with the N. C. Experiment Station.

1. Fertilizer and Crop Rotation Studies. The object of this experiment is to determine the value of commercial fertilizers on the blacklands and to compare the efficiency of various sources of phosphates. The test is run in a three year rotation of corn, oats and Irish potatoes. The oats and Irish potatoes are followed by soybeans to be plowed under. The phosphoric acid from different sources in the complete fertilizer has not materially increased the yields of any of the crops. Potash seems to be the most essential plant feed element needed.

2. Cultural Treatment of Corn and Soybeans. This experiment is divided into two series, with one series planted to corn and the other to soybeans each year. There are eight one-fifth acre plats in each series, prepared as follows:

1. Plowed 8 in. deep, level, not rolled.
2. Plowed 8 in. deep, level, rolled.
3. Disked 4 in. deep, level, rolled.
4. Disked 4 in. deep, level, not rolled.
5. Plowed 8 in. deep, ridged, not rolled.
6. Plowed 8 in. deep, ridged, rolled.
7. Plowed 4 in. deep, ridged, rolled.
8. Disked deep, ridged, not rolled.

The results show that there are no benefits to be derived from rolling this muck soil. Flat cultivation has shown to be better than ridging except in an extremely wet year when the ridging was slightly better. As a general practice the flat cultivation has been decidedly better than the ridging. Deep plowing has not proved to be superior to disking.

3. Lime Experiments. The test includes twenty-one plats. The lime is applied in the form of hydrated lime, finely ground limestone and marl at the rate of one, two, three and four tons per acre every three years.

This experiment has been running for the past twelve years, and the results show that finely ground limestone is slightly better than hydrated lime or marl. However, the use of lime in any form in all cases has resulted in materially increased yields.

4. Fertilizer Experiment with Corn and Soybeans in a Two Year Rotation. The test consists of two series of twenty plats each. Nitrogen, phosphoric acid and potash are applied singly and in combination for the purpose of determining the best fertilizer for corn and soybeans. Potash alone seems to be the best fertilizer for soybeans. Nitrogen and Potash applied together have not so far increased the yield of soybeans for hay or seed over the potash plats.

5. Manganese and Copper Sulphate Studies. This experiment has only been running one year, and the first year's results do not indicate that either element will materially increase the yield of corn.

6. Yellow Corn Variety Test. The purpose of this test is to endeavor to find a yellow variety of corn that will yield as well as our standard white varieties. The yellow varieties so far tested have not yielded as heavy as white corn.

7. Small Grains for Forage and Cover Crops. Abruzzi rye, Tennessee hooded barley and two varieties of oats were seeded at this Station during the fall of 1928 and 1929. No winter killing has been observed so far. Abruzzi rye made the best winter and early spring growth, and also the best growth for turning under by April 1st. Oats made an earlier spring growth than barley, but were not equal to rye for grazing and cover crop purposes.

8. Pasture Grass Studies. Eight plats were seeded to different grass mixtures for the purpose of determining the best pasture mixtures for the blacklands. The results so far show that Kentucky Blue grass, and Red Top will furnish most grazing. The other grasses and clovers used in the experiment have practically disappeared.

9. Seed Corn Breeding and Selection. The white corn variety tests have shown Bagley's Highland Horsetooth to be the superior variety for our soil type. Each year selections of this variety are made for producing seed for planting the following year.

10. Soybean Varieties. The most promising varieties of soybeans are tested each year for seed production. The results show that the Tokyo and Herman are the best seed producers. The Otootan and Laredo rank high as hay varieties.

SWINE INVESTIGATIONS.

These projects are handled in cooperation with the N. C. Experiment Station. The Station herd consists of fifteen pure bred Poland China sows and a boar. All pigs used for experimental puposes are raised on the farm. Also a number of registered pigs are sold each year to farmers of the section who are interested in pure bred hogs or the building up of grade herds.

11. Protein Supplement for Fattening Hogs. Various protein supplements including cotton seed meal, fish meal and soybean oil meal have been fed to different lots of pigs to study the value and cost of each. More recently a mixture of equal parts by weight of cotton seed meal, fish meal and soybean meal have been tried out in comparison with fish meal alone as a protein supplement. In each test the mixed protein supplement has been more efficient and has produced cheaper gains. The cost per hundred pounds gain varies with the price of corn as the hogs consume more of the mixed protein and less corn than the hogs fed corn and fish meal.

12. Factors Causing Lameness in Swine. There has been difficulty with the fall farrowed pigs at this Station since 1925. In one to two months after the pigs were put into the fattening pens some of them would get so lame they could not walk and occasionally one would die. The general remedy for this condition has been to turn the pigs on to rye pasture for a short while each day, but this year the dry lot rations were supplemented in an effort to alleviate the trouble. Sixty pigs averaging 93 pounds in weight were divided into four equal groups on January 2. They were kept on floored pens from this time until they were ready for market on March 19, or 76 days, except that they were driven a short distance to the scales each 14 day period throughout the trial.

Each of the four groups were fed shelled corn, fish meal and mineral from self feeders. White corn was fed to groups 1,3,4 and yellow corn to Group 2, and for each 3 pounds of fish meaf fed to Group 3 one part of ground soybean hay was added while 1 pound alfalfa meal was added to each 3 pounds of fish meal for Group 4.

Eight of the pigs in Group 1 developed some lameness, although none of them died, while none of the pigs in the other three groups were effected. Group 2 receiving yellow corn made more rapid gains, consumed less feed per unit gain, and was more profitable than any of the other groups.

13. Cost of Maintaining Swine Breeding Herds.

This data is reported in detail in Experiment Station Bulletin 272 "The Cost of Raising Pigs to Weaning Age," which was published in May 1930.

BEEF CATTLE.

These tests are handled in cooperation with the U. S. Department of Agriculture and the N. C. Experiment Station.

14. Quality of Meat Studies with Beef Cattle.

The herd of native cows has been divided into two equal groups with one group being bred to a pure bred Hereford bull, and the other to a native scrub bull of similar ancestry to the cows. The calves produced by these bulls were full fed a ration of shelled corn, cotton seed meal and soybean hay, and this first year's results show that calves from the Hereford bull, during 170 day fattening period, consumed 479 pounds of grain and 408 pounds of hay for each 100 pounds of gain, made an average daily gain of 1.81 pounds, and sold for $12.50 per hundred weight, while the calves from the native bull consumed 543 pounds of grain and 441 pounds of hay for each 100 pounds of gain, made an average daily gain of 1.48 pounds and sold for $11.79 per hundred weight. The grade calves were also heavier and carried more finish when shipped to market, their average final weight being 631 pounds while the calves from the native bull averaged only 534 pounds in weight at this time.

15. Pasture Value of Native Reeds. There is a dense growth of reeds (Arundinaria) covering many acres of land in the eastern section of North Carolina. This growth is especially profuse in the vicinity of the Blackland Station and is used as a pasture for both cattle and work stock.

Last year approximately 160 acres of this reed growth furnished abundant grazing for 29 native cows and two bulls from June 7 to January 1, and in addition 27 of the cows suckled calves for six months of this period. During the seven months grazing period the 29 cows made an average gain of 67.0 pounds.

16. Cost of Wintering Beef Cattle. Cost records are being kept on wintering beef cattle in this section. The test was started last fall and will be reported later.

17. Improvement of Family Milk Cow by Purebred Sire.

A registered Guernsey bull is maintained on the Station for community service. To date about 100 cows have been bred and a number of promising heifers are coming into milk. The project has proven to be one of the most valuable undertaken by the Station. It has created an interest in better milk cows, and helped to put across the "Family Cow" project as sponsored by the State Extension Service.

SHEEP.

18. The Farm Flock. A small flock of sheep has been added to the livestock program at this Station. Data will be kept on the cost of handling a farm flock and the returns from the wool and lambs.

DRAINAGE.

19. Spacing of Tile Drains. Proper drainage is one of the most important problems confronting the blackland farmer. The present tile drainage system on the Station is not adequate during the rainy seasons. The lines are 330 feet apart which was considered the proper distance when the system was installed fifteen years ago, but the soil has settled considerable during this period, which required additional tile lines. The Test underway at present is to find out just what distance apart the tile lines should be layed for best results.

20. Value of Blind Inlets for Tile Lines. A number of blind inlets have been put in over the tile drains in order to provide an outlet for surface water. General observations are being made to determine this effect on drainage.

IMPROVEMENTS.

The following improvements completed during the period have materially benefited the Station as a whole, and have allowed for an expansion of the work: Beef cattle barn 30 X 50 feet with loft above for storage; Clearing for planting 50 acres of new ground; three miles of new fence and general repairs to buildings and equipment.

UPPER COASTAL PLAIN STATION - ROCKY MOUNT - Route 5.

R. E. Currin, Jr., Ass't Director in Charge.

Station established in 1902; Soil type, Norfolk Sandy loam; Area of Farm, 202 acres; Elevation 105 feet above sea level; Mean annual temperature 60.8 degrees Fahr.; Annual rainfall, 49.15 inches.

The research work on this station has been increasing rapidly in the past few years, until at the present time most of the available land is taken up with these projects. Following is a list of the most important projects underway.

AGRONOMY.

The tobacco experiments are handled in cooperation with the U. S. Department of Agriculture.

1. Tobacco Fertilizer and Rotation Studies. The rotation experiment consists of continuous tobacco, a two year rotation with tobacco and cotton and a three year rotation with corn, cotton and tobacco. These rotations include a fundamental fertilizer test. So far the tobacco in the three year rotation has been leading. The fertilizer giving the best results has contained 80 pounds of phosphoric acid, 40 pounds of nitrogen and 80 pounds of potash.

2. Tobacco Variety Tests. Virginia Bright Leaf, Bonanza, Cash, Hickory. Pryor and White Stem Orinoco seem to be the best varieties for this section.

3. Potash and Lime Experiments with Tobacco. This is the third year for this test, and the use of lime so far has not increased the yield of tobacco. Muriate of Potash produces a better yield and value per acre than the Sulphate, but when large quantities of potash are used the burning quality of the cured leaf is not near as good from the muriate plats as it is from the sulphate. A mixture of 1/2 muriate and 1/2 sulphate of potash, substituting sulphate of potash magnesia in place of sulphate where sand-drown is prevalent, is recommended.

4. Tobacco Spacing Tests. Plants set 18 and 20 inches apart in the row seem best on fairly fertile soil or where heavy amounts of fertilizer are used.

5. Side Applications of Fertilizers to Tobacco. Small applications of nitrogen and potash or a complete fertilizer gave good results this year. Where nitrogen was applied alone the tobacco had a tendency to green up too much, probably due to an unbalanced condition.

The following agronomy experiments are handled in cooperation with the N. C. Experiment Station.

6. Nitrate of Soda - Sulphate of Ammonia Tests with Cotton.

This experiment was designed to compare the efficiency of nitrate of soda and sulphate of ammonia when used singly and in various proportions with each other as sources of nitrogen for cotton inan 8-6-4 mixture. An average of two year's results indicate that there is very little difference in the efficiency of these two sources of nitrogen on this type of soil. Deriving part of the nitrogen from each source gave slightly larger yields than when either material was used as the sole source of nitrogen.

7. Concentrated Fertilizer Experiment. Indications from two year's work with these materials are that they are not more toxic to young cotton seedlings on this type of soil than the ordinary commercial fertilizers. Based on increased yields per acre the concentrated fertilizer mixtures are as effective as the less concentrated mixtures made from superphosphate, manure salt and the ammonia derived from nitrate of soda and sulphate of ammonia.

8. Fertilizer Ration and Quantity Experiment. This experiment was run with continuous cotton from 1923 to 1928, inclusive when it was revised to include peanuts in a rotation of cotton and peanuts. It is designed to determine the effect upon stand, growth, maturity and yield of cotton and peanuts, of applications of different quantities of proportions of phosphoric acid, nitrogen and potash,

Varying the percentage of phosphoric acid from 6 to 13 percent, the nitrogen from 3 to 7 percent, and the potash from 2 to 6 percent has had little effect upon the average yield of cotton.

One year's results with peanuts have not shown any material increase from the use of any fertilizer mixture.

9. Rotation Experiment. This field consists of two series, limed and unlimed, has been run in one, two and three year rotations with and without legumes since 1910. The two year rotation with legumes was better than continuous cropping of either cotton or corn. The greatest increase yields, however, were secured with a three year rotation with legumes and a complete fertilizer.

Results published: N. C. Experiment Station Bulletin No. 255. 1928.

10. Rotation Experiment. There are 13 different rotations run in duplicate series in this field which was started in 1924. On the north series the crops are fertilized with the mixture found best by the Experiment Station for each crop to be grown, while on the south series the crops are fertilized so that at the end of any rotation all plats will have received the same amount of nitrogen, phosphorous and potash. A study of the value of one, two, three and four year rotations with and without legumes is being made. To date corn and peanuts have responded most to the rotations. The following table is given to show the 1929 yield of corn following six different rotations:

Rotation No.	Number Years	Crops	Yield bushels Corn per Acre.
1	Continuous	Corn	30.6
2	"	Corn with Crimson Clover	32.2
3	2 years	(Clover & rye (Corn (Cotton	34.2
4	2 years	(Corn with (Crimson Clover (and rye (Cotton with (Crimson (Clover and (rye	37.8
5	3 years	(Peanuts follow- (ed by Crimson (Clever and rye (Corn with cow- (peas (Cotton with Crim- (son Clover and rye	51.9
6	4 years	(Corn with cow- (peas, rye (seed). (Rye seed, soybeans ((seed) cotton, (oats and vetch, (soybeans ((Soil improvement)	56.7

11. Seurces of Nitrogen. This experiment was started in 1925 to compare the relative efficiency of inorganic and organic nitrogen carriers when used as the sole source of nitrogen in a complete fertilizer. Fertilizer treatments are made in duplicate, one series being limed and the other unlimed.

For hay Virginia is the best as a quick maturing variety and Otootan as a variety requiring full season where land is available. Of the new varieties one of the importations by Dorsett from China is showing up especially well and may replace Tokyo as the best all around all purpose variety.

5. Crotolaria Test. In cooperation with the N. C. Experiment Station and the U. S. Department of Agriculture. Tests of a nymver of types of crotolaria are underway with the view of studying the value of this type of plant for soil improvement, livestock feed, etc. Two years tests indicate that certain types of crotolaria will be of value to the agriculture of Eastern Carolina.

6. Lespedeza Tests. In cooperation with the N. C. Experiment Station. One year's test of four types of lespedeza has shown the Kobe to yield the most hay and Korean the least. Tennessee No. 76 ranked next to Kobe and Common Lespedeza third. A yield of 2840 pounds of hay per acre from the Kobe was secured in 1930 under drought conditions. Tennessee No. 76 yielded 2532 pounds, Common 1400 pounds and Korean 1413 pounds. The Korean contained crab grass accounting for part of its yield weight.

7. Corn Variety Tests in cooperation with the N. C. Experiment Station. These tests have shown clearly the need for breeding and selection work with corn under Eastern Carolina conditions. In the past attention has been given more to cotton than to corn. In the future on account of the boll-wevil, corn will be the more important crop apparently in South-eastern North Carolina. The test conducted by the Station comparing yellow and white corns has shown clearly the need of producing a variety of yellow corn for feed purposes which will be equally productive with the best white corns now grown.

8. Corn Selection Work. In cooperation with the N. C. Experiment Station, the Cockes Prolific corn is being grown and selected with a view of securing a high production strain.

9. Corn and Soybean Planting Tests. In cooperation with the N. C. Experiment Station a study is being made of planting methods for corn and soybeans comparing the two crops planted separately, planted in alternate rows and planted in the same row. While this test has been made in a number of other states with unanimous results favorable to planting soybeans in the same row with corn, there seems to be sufficient diversity of opinion in this section to warrant a demonstration.

10. Winter Legumes . In cooperation with the N. C. Experiment Station, tests are being conducted of the various legumes suitable for growing during the winter in South-eastern North Carolina. This test includes such crops as Austrian Winter peas, Vetch, Crimson clover, etc. for the purpose of determining the relative merits and uses of these crops.

11. Grain Crop Tests. In cooperation with the U. S. Experiment Station tests of grain crops planted in the autumn and planted in the spring are being made with a view to determining the best grains to grow and the best times to plant. This test is especially designed to throw light upon what varieties will withstand winter conditions as there is much lossage from winter killing of oats, especially in this section.

12. Value of Special Grasses and Legumes under Southeastern North Carolina Conditions. The Station is conducting a number of miscellaneous tests of special grasses and legumes with a view to determining their value for pasture and lawn uses in this section. At the present time special attention is being given to White Dutch Clover as a winter pasture legume and Centipede grass.

13. Pasture Development in Eastern North Carolina. The Station is conducting its work in developing pastures under Eastern North Carolina conditions. This work has resulted in turning land which was considered worthless ten years ago into profitable pasture estimated to be giving returns of at least $50.00 per acre as grazing land for dairy cows.

ANIMAL INDUSTRY PROJECTS

Dairy Investigations in Cooperation with State Experiment Station.

14. Use of Fly Repellants in Maintaining Summer Milk Production.

15. Herd Development with Special Reference to Improvement from use of Better Sires.

16. Cost of Maintaining the Herd Sire.

17. Farm Dairy Refrigeration Studies with Special Reference to Initial Cost, Cost of Operation and Up-keep.

18. Study of Feeding Rations with a View of Determining Best Usage of Home Grown Feeds.

Results from the dairy investigations are being reported through the State Experiment Station. The investigations are conducted and financed at the Coastal Plain Station.

Poultry Investigations in Cooperation with State Experiment Station.

19. The Influence of Meat Meal versus Milk on the Production and Health of Poultry. This test has shown that while meat meal is the cheaper food, milk has given the best results from the standpoint of health of the flock and production.

20. Effects of Sulphur in Poultry Feed. This test has

The very thick spacings (4 inch, 2 plants to the hill) are not desirable due to reduced yield, many one seeded pods, and excessive top growth which might be objectionable during the dry season.

20. Peanut Breeding. Selection work for higher yield and better quality is being carried on with the Virginia Bunch variety.

21. Cotton Spacing Experiment. Average of four applications.

Distance between hills.	Plants per hill	Average yield of seed cotton 1st picking.	Total	Average yld of Lint	Per-cent Lint	Staple	No. of bolls per lb. seed cotton
12 in.	2 plants	622	1264	462	36.5	1 1/32	56
12 in.	Not thinned	727	1425	508	25.6	1	59
18 in.	2 plants	698	1406	405	35.2	1 1/32	55
18 in.	Not thinned	712	1410	513	36.4	1	57
24 in.	2 plants	525	1162	414	35.6	1 1/32	51
24 in.	Not thinned	585	1200	427	25.6	1	54
12 in.	2 plants	596	1238	452	36.5	1 1/32	56

HORTICULTURE.

Experiment in cooperation with N. C. Experiment Station.

22. Pecan Variety Test. This experiment has been running about 25 years. The Schley, Stuart, Alley and Money Maker varieties show up best in this section.

23. Sweet Potato Storage Work. This experiment has clearly demonstrated the value of storing in crates versus bins. It has paid to buy the crates in every instance.

24. Sweet Potato Selection. We have developed by selection a strain of Porto Rico sweet potato that has given a large yield over the average run of this variety. The quality and shape is also better.

Yields estimated by harvesting a fraction of each acre as plats were hogged off.

16. Cotton Improvement. Selection work for higher quality of staple, better yields and better adaptation to boll-weevil conditions is being continued. The Mexican variety is being grown exclusively. A large number of plant-to-row progenies are grown each year, and strain tests including the more promising pedigree strains are carried on at this farm. Several of these strains show marked improvement over the parent variety in yield, uniformity of staple and plant characters. Some strains were able to utilize heavy fertilization better than others.

Seed of the new pedigree strains were distributed to the farmers during the past season and larger amounts will be available another year.

17. Cotton Breeding. During the season of 1929 crosses were made between several strains of the Mexican variety. The F-1 generation of these crosses are being grown during the summer of 1930. Some of these crosses appear to have more fruiting vigor than the parents. Excessive vegetative growth which might be expected in the F-1 of some of these crosses did not show up, due probably to dry weather conditions as none of the cotton plants made large growth this season.

18. Peanut Variety Experiments. Results secured in 1929 show that the largest yields were secured from the Improved Spanish, followed by the North Carolina Bunch, Virginia Bunch and Jumbo Runner in the order named. The value per acre would depend on the market price for each type. The yields, percent of hand-picks, grade, etc. are given in the following table:

Variety	Yields Lbs. per Acre.	Per-cent Hand-picks	Per-cent Jumbo Fancy Hand-picks.	Shell-ing	U. S Grade	Grade Class
Jumbo Runner (Hancock)	1440	47.3	8.0	64.5	1	B
Jumbo Runner #5-24-3	1215	51.4	8.5	66.5	1	A
Virginia Runner	1410	27.3	22.0	65.8	2	A
Virginia (Jumbo) Bunch	1485	32.0	21.1	66.0	2	A
N. C. Bunch	1770	16.0	22.3	66.8	5	A
Improved Spanish 2 B	1830			71.2	1	A

19. Peanut Spacing. Results of spacing experiments with Virginia Bunch peanuts showed best yields from 4 inch spacings, one plant to the hill and 8 and 12 inch spacings, two plants to the hill. Reduced yields and many one seeded pods were secured from two plants every 4 inches. Best yields were secured from the Jumbo Runner variety with two plants, 12 inches apart; two plants 16 inches apart and one plant 12 inches apart and two plants 8 inches apart respectively. The closer spacings produced more of a determine pod growth than the wider spacings.

LIVESTOCK.

In cooperation with the N. C. Experiment Station.

25. Sheep Project. This project deals primarily with the raising of lambs for the early market and to determine the best methods of handling the flock in the utilization of pasture, cover crops, etc.

26. Hogs. A record is kept showing the cost of raising pigs to weaning age. Also cost of carrying over brood stock. The pigs are used in the utilization project outlined under Agronomy.

PATHOLOGY.

In cooperation with the N. C. Experiment Station.

27. Seed Treatment of Cotton Seed. Profitable increases have been secured by treating cotton seed with some of the commercial dusts now on the market. The cost of the dust is very small, and we are advising the use of same, especially where cotton is to be planted early.

28. Tobacco Mosaic. To determine how tobacco becomes infected with this disease. By not allowing persons handling plants, to use tobacco, we have been able to keep infection very low. There seems to be other sources of infection which are being studied.

29. Boll-weevil Control. The demand for definite information on boll-weevil has been increasing rapidly each year, and we have spent some time during the summer assisting farmers, County Agents and agricultural teachers in boll-weevil control.

30. By applying the information derived from our experiments, we have been able to double the county average of cotton with very little increase in cost with the exception of harvesting.

IMPROVEMENTS.

The following improvements added during the past two years have allowed for an expansion of the work and have added to the general appearance of the Station; ten acres of waste land has been cleared, drained and prepared for pasture; repaired and painted horse barn, new lot fences, new sheep barn and general repairs.

TOBACCO STATION - OXFORD, N. C.

E. G. Moss, Ass't Director in Charge.

Station established in 1912; Soil type, Durham sandy loam; Area of farm, 250 acres; Elevation, 500 feet above sea level; Mean annual temperature, 58 degrees Fahr: Annual rainfall, 46.03 in.

The tobacco experiments which are the major part of the work on the station are conducted on a cooperative basis with the Office of Tobacco Investigations of the U. S. Department of Agriculture. This work was begun in 1911, and has expanded each year. During 1930 approximately 20 acres of land were used for tobacco. This was divided into about 500 plats; 4 acres of new land were cleared and planted in tobacco during 1930 preparatory for some new experimental work dealing with some of the minor plant food elements. This new land is of the Durham sandy loam type and is well located for plats.

The following will give the general program of work on this Station:

1. Fertilizer Tests: Thirty-six plots of 1/20 acre each. One-half of each of these plots limed with magnesium limestone at the rate of one ton per acre broadcast every third year.

The Object: To test out the more important sources of nitrogen, phosphoric acid, and potash, also different combinations and rates of application with and without magnesium limestone.

Result: Cottonseed meal has stood up as one of the best sources of nitrogen with Nitrate of Soda next. Ammonium Sulphate gives good results on limed end of plats. A combination of organic and inorganic ammoniates is better than any individual source. Basic Slag and Bone meal are too slow for tobacco as a source of phosphate. Superphosphate is the best source.

2. Special Potash Tests: Ten major plats, 1/20 acre each. These plats are divided into plats of 1/40 acre each and limed one-half every third year.

The Object: To compare muriate and high grade sulphate of potash using rates 12,24,36 and 80 pounds K_2O per acre. The nitrogen and phosphoric acid remaining constant.

Result: Muraite of potash produces a better yield and value per acre than the sulphate, but when the larger quantities of potash are used the burning quality of the cured leaf is not near as good from the Muraite plots as it is from the sulphate. There is a constant increase in yield and quality as the potash is increased to 60 lbs. per acre, therefore, it seems advisable to use not less than 40 to 60 pounds of potash per acre, not more than 20 pounds of which should be derived from Muriate. By the use of small amounts of Muriate up to about 20 pounds per acre, there does not seem to be enouhg chlorine present to injure the burn of the leaf.

3. Different Sources of Potash with Dolomite and Calcite:

Eighteen 1/40 acre plats.

The Object: To compare the different available sources of potash, viz., Trone, Muriate, German Muriate, 20% Manure Salts,

German Sulphate, Magnesium-Potassium Sulphate, and Kainit. These plots are divided into three series; 1.- Dolomite (magnesium limestone) is used; 2 - Calcite (lime with less than 1% magnesia) is used; 3 - No lime.

Result: The section on which magnesium limestone (Dolomite) is used gives the best yield and quality with no "sand-drown". On the other two series "sand-drown" occurs on all plats except where magnesium-potassium sulphate is used. The Kainit plats give a large yield of tobacco but poor quality of leaf.

4. Quantitative Magnesium Tests. Started in 1923. Eleven plats 1/20 acre each.

The Object: To determine the actual amount of magnesia required under normal conditions to prevent "sand-drown" of magnesium hunger.

Result: That approximately 20 pounds of available magnesia per acre will prevent "sand-drown". This can be supplied by magnesium limestone or from potash salts.

5. Special Magnesium Tests or Tests with Magnesia, Sulphur, and Chlorine for Tobacco.

Started in 1922. Twelve plats 1/40 acre each.

The Object: To determine the effect magnesia, sulphur and chlorine has on tobacco and relative value of each.

Result: At the end of eight years the conclusion reached was that all of these so called minor plant food elements were essential. The sulphur on this particular soil did not appear to be exhausted, but magnesia was becoming depleted, and the addition of these elements gave beneficial results.

6. New Nitrogen Tests: Started in 1925. Forty-three 1/20 acre plats. One of which was limed at the rate of one ton per acre using dolomitic limestone broadcast.

The Object: To test out new forms of nitrate under tobacco.

Result: A number of the synthetic forms of nitrogen, while chemically, are classed as organic nitrogen, act in the field as an inorganic. Therefore, do not seem to be able to replace the organics of vegetable and animal origin. Urea compares favorably with the old standard sources.

7. Tobacco after Cowpeas. One-half acre in four plats 1/8 acre each.

The Object: To determine if tobacco can be grown after legumes provided sufficient amount of phosphoric acid and potash is supplied.

Result: Tobacco of fair quality and yield can be grown after cowpeas and soybeans have been plowed under, if liberal applications of phosphates and potash are added provided the tobacco is planted reasonably close on the drill, topped high and harvested by priming. The quality is not quite as good as tobacco grown on weed land with a complete fertilizer.

8. Rotation System for Tobacco. Four plats, 1/2 acre each.

The Object: To test out a few practical systems of rotation with tobacco as the principal crop.

A four year rotation with corn, oats and grasses and tobacco.
A three year rotation with oats (soybeans) and rye (seed) and tobacco.

A two year rotation with oatsor rye and tobacco.

Result: Each of these rotations is adaptable to farms which have varying amounts of available land suited for growing tobacco.

9. Variety Tests. Thirty or forty plats, 1/34 acre each.

The Object: To test out and classify the so called various varieties of tobacco, and to select those best suited for the production of cigarette tobaccoes.

Result: During the past few years something over a hundred and fifty varieties of tobacco have been tested, frequently showing a difference in value between the poorest and the best of $75. to $100. per acre. The Cash, White Stem, Oronoco, Jamaica and Bonanza are the four varieties giving the best results and are recommended to the growers. Seed of these varieties are ready for distribution in limited quantities.

10. Plant Nutrition Investigations. Fields 3 and 5. Sixty-three, 1/40 acre plats in each field.

The Object: To determiine the effect of vetch, annual clover, soybeans, cowpeas, grass and weeds on tobacco, cotton and corn, and the residual effect on wheat, oats and rye.

Result: Cotton and corn give excellent results after all the legumes, but make larger yields after vetch and clover than soybeans and cowpeas. In dry season it is more difficult to secure good stands after vetch and clover where it is turned late than after the other legumes. On the other hand tobacco does best after weed and grass plats.

11. Experiments with Sulphur, Chlorine and Magnesia.

Additional work was begun in 1926 consisting of forty-two 1/20 acre plats to determine the effect of sulphur, chlorine and magnesia and their relation to the different forms of potash.

Result: Detailed studies of the tobacco from these plats are necessary. Chemical analyses have to be made of the cured tobacco. Magnesia deficieney of the cured leaf can be determined chemically and checks up nicely with field observations. About 20 pounds of chlorine per acre is essential.

12. Distance of Planting. These test have been discontinued. The results showed that closer planting on the drill produced a larger percentage of cigarette grades, therefore, an increase in acre value.

13. Black Root Rot (Thielavia)

Two acres of land which are badly infexted with black root rot within three miles of the Station was leased and planted in 87 different varieties and strains of tobacco during 1930. These tobaccoes consisted of a few resistant strains of Kentucky and Wisconsin, the balance were flue cured selections.

Results: Two flue-cured selections stand up well and show considerable promise of being resistant.

14. Mosaic: In addition to some test plats showing the decrease in value of tobacco when inoculated with the virus causing mosaic, which amounted to about $100.00 per acre, a large amount of work was done with plant beds of growers in the four adjoining counties.

Results: The majority of the mosaic comes from seed beds, and bed sanitation is essential for its control.

15. Sweet Potatoes: (In cooperation with Dr. R. F. Poole of N. C. State College.)

The Object: To control sweet potato scurf.

Results: Satisfactory - Reference Dr. Poole.

16. Cotton: From eight to ten acres are planted in Mexican Big Boll cotton. These seed are saved and sold to growers at a reasonable price.

17. Corn: A good selection of Weekley's Prolific seed corn has been developed. About 40 bushels were sold in 1930 as registered corn.

18. Sheep. One pure bred Shropshire ram, two pure bred ewes and seven grade ewes are being grown.

Object: To assist local farmers in getting better and more sheep on their farms.

19. Registered Jersey Bull: This bull is kept for service in the community. Approximately 75 cows have been bred to him during the past two years.

20. Swine.

This project is to determine the cost and returns from a small farm herd of hogs, and to furnish breeding stock to farmers in the section.

Improvements.

The farming equipment has been materially improved during the past two years. A new tractor and harrows, four young mules, a farm wagon, corn harvester and binder, new mowing machine and other small tools have been purchased. About fourteen acres of new land have been cleared and put into cultivation. Between thirty and forty acres of woodland have been thinned and several hundred feet of small drain tile has been laid. One new five room tenant house has been built and another was practically rebuilt, adding two rooms with chimney. All of the outbuildings have been kept in good repair.

General

The tobacco farmers of North Carolina are becoming better acquainted each year with the work that is being done at the Tobacco Station. This is evidenced by the large number of visitors during the year, and the daily inquiries which come through the mails. The Annual Field Day meeting held in August, 1929, was attended by approximately four thousand visitors. At the 1930 meeting approximately five thousand visitors were present. A large number of those attending these meetings go to the experimental fields and study the results. It is not unusual to see four or five hundred in the different fields at the same time. In February, 1930, a special meeting was held for the purpose of discussing fertilizer and variety problems with the growers before the crop was begun. Something over three hundred farmers and business men spent the day at this meeting. In addition to these special meetings, hundreds of farmers visit the Station each year. Over five hundred growers a year have visited the Station during January and February for the past two years for the purpose of having their seed cleaned and treated, and to get information on varieties. It is interesting to note that these visitors are not all confined to North Carolina, but come from other tobacco states, and a number each year come from foreign countries.

PIEDMONT STATION - STATESVILLE, N. C.

H. L. Meacham, Acting Ass't Director in Charge.

Station established 1903: Soil type, Cecil clay loam: Area of Farm, 208 acres: Elevation, 950 feet above sea level: Mean annual temperature, 58.6 Fahr.: Annual rainfall 50.98 inches.

The following will give a brief progress report on the chief

experiments under way.

LIVESTOCK.

In co-operation with N. C. Experiment Station.

1. Comparison of Carbonaceans Roughages. Twenty-six grade steers were purchased in Madison County, North Carolina, and shipped to the Piedmont Station for fattening. They were divided into two equal groups and full fed for 136 days. Each group received equal parts of shelled corn and cotton seed meal as their grain ration, but cottonseed hulls furnished roughage for Group 1, while in Group 2 corn stover was fed.

The steers in Group 1 required 57 pounds less corn and 57 pounds less cottonseed meal to produce 100 pounds gain than those in Group 2. They also consumed slightly less roughage, but possibly these results are not as indicative as they should be because of the fact that the corn stover was of rather poor quality.

2. Drenching Lambs for Stomach Worms. The drenching of sheep with a nicotine sulphate solution has proved to be a satisfactory practice in the control of stomach worms.

3. Wintering the Farm Flock of Sheep. The object of this work was to carry the farm flock through the winter in the most economical and practical manner in keeping with general farm conditions, utilizing the stalk and stubble field gleanings, cover crops, etc.

4. Cost of Raising Pigs. The results of this work is published in Experiment Station bulletin No. 272.

AGRONOMY.

In co-operation with the N. C. Experiment Station.

5. Soil Fertility Work. The results show that phosphoric acid is the main limiting factor in the profitable production of corn, wheat and cotton, with nitrogen ranking second in importance. Potash is least required of the three main plant food elements for this soil type.

6. Superphosphate versus Rock Phosphate. Results show that superphosphate is a more efficient carrier of phosphoric acid than rock phosphate when used in equivalent amounts under corn.

7. Nitrogen Carriers. Results from cotton show nitrate of soda best, followed in order by cottonseed meal, sulphate of ammonia, lunasaltpeter, urea, calcium cyanamid, nitrate of ammonia and sludge.

8. Crop Rotations. The crop rotations work consists of a

study of the value of one, two and three-year rotations of corn and wheat, with and without the use of legumes, cowpeas or soybeans and red clover, the fertilizer applications being the same with all rotations.

Results for corn over a period of eight years show a gain for the three-year rotation of 16.3 bushels over plats where continuous corn was grown. The two-year rotation has shown a gain of 11 bushels. Results for wheat show a gain for the three-year rotation of 6.5 bushels over continuous wheat, while wheat in a two-year rotation gave a gain of 2.4 bushels over continuous wheat.

9. Cotton Improvement. The Mexican Big Boll variety is being grown at the Station. Pure line selection work is carried on and high yielding strains have been developed which are well adapted to the conditions under which they are grown. These strains are medium early, high yielders, and produce a staple of uniform length and high spinning quality.

10. Soybean Varieties. The Tokyo, Herman and Virginia seem to be the best seed producers: while the best hay yields were secured from Otootan, Laredo, Herman and Chiquita. The George Washington is a medium early, non-shattering variety, and is very promising for the Piedmont section.

SMALL GRAIN IMPROVEMENT.

11. Corn. An improved strain of Weekley's Improved corn is grown on this Station. Each year selected seed corn of this variety is distributed to growers at a reasonable price.

12. Wheat. The most outstanding result of the wheat work for the past season was the establishment of a standard of yields by which all new varieties of strains that are proposed to be grown by the farmers of the state can be measured for yielding qualities. The average results for a seven-year period are as follows for the four leading varieties:

Variety	Average Yield Bushels per Acre
Fulcaster	29.2
Gleason	28.4
Purple Straw	27.2
Leap's Prolific	27.0

13. Oats. The first problem in growing fall sown oats is to find that variety which will withstand the changeable winter weather conditions of the Piedmont region of the state. Fulghum and Appler are most excellent winter varieties, but are very easily winter-killed. In tests conducted for six years on the Piedmont farm the Fulghum, one of the best yielders, winter-killed about one-half. The above varieties are being grown in comparative tests at the Piedmont farm with cold resistant varieties like

Norton, Lee, V. P. I. and others to determine which will produce the greatest average yield.

LEGUME STUDIES.

In co-operation with the U. S. Department of Agriculture

In 1927, this Department entered into an agreement with the United States Department of Agriculture to conduct legume investigations at the Piedmont Station. The work is progressing in good order and has created considerable interest among the farmers of the section. The results show so far that the source of alfalfa and red clover has an important bearing upon the successful growing of either crop under Piedmont conditions. At present the following projects are under way, and the work will be enlarged during the coming season.

14. To determine the relative value of alfalfa varieties and strains for hay under Piedmont conditions.

15. To determine the value of foreign red clover seed of known origin and improved seed with port of entry from Baltimore and South for hay yields.

16. To determine the value of lespedeza varieties for hay and soil building on Piedmont soils. Owing to the extreme dry weather this spring, the stands were very poor. The Korean variety seems to withstand drought conditions better than other varieties tested.

HORTICULTURE.

In co-operation with the N. C. Experiment Station.

17. Peach Thinning Tests. The results of peach thinning experiments at this Station prove conclusively that thinning increases size and market value of peaches. Yield, quality and condition seems to show that a spacing 4 to 6 inches between fruits gives the best results.

18. Peach Pruning. This experiment was begun in 1923 and the results continue to show that lightly pruned trees give larger yields, better color and reduced pruning costs, than where heavy pruning is practiced.

19. Peach Fertilization. The strong Cecil clay loam soils of the Piedmont section of the state are well adapted to the growing of peaches and indications are that nitrogen may possibly be the only element necessary to maintain growth and production of peach trees grown on this soil type.

20. Fruit Variety Studies. In order to determine the value of new and note-worthy fruits under Piedmont conditions, this test has been started to supply information on varieties. This test includes varieties of peaches, cherries, grapes and small fruits.

IMPROVEMENTS

The improvement work completed during the past two years has consisted of general repairs to buildings and equipment; landscape plantings, new garage, building for housing small experimental grain, thrasher and seed cleaning machinery; the purchase of a two-horse farm wagon and Farm-all tractor with plows and harrow.

MOUNTAIN SECTION - SWANNANOA, N. C.

S. C. Clapp, Ass't Director in Charge.

Station established in 1908; Soil types, Toxaway loam and Ashe clay loam; Area of Farm, 305 acres; Elevation, 2600 feet above sea level; Mean annual temperature, 54.1 degrees Fahr.; Annual rainfall, 41.06.

The work on the Mountain Station during the period of this report has progressed in a satisfactory manner and additional information has been secured from the experiments under way. The co-operation with the various workers from the N. C. State College and the U. S. Department of Agriculture has been most helpful and pleasant.

HORTICULTURE.

The Horticulture work, in co-operation with M. E. Gardner of the State College, has developed more in the past two years than in any previous period.

Fruit Variety Studies. In order to determine the value of new and note-worthy varieties of fruits under Mountain conditions, the following plantings have been made:

1.	Apples	38	Varieties
2.	Grapes	72	"
3.	Raspberries	14	"
4.	Dewberries	2	"
5.	Blackberries	8	"
6.	Cherries	10	"
7.	Strawberries	16	"

These varieties are added to from year to year and records kept on varietal characteristics. The strawberry variety test has been running longer than the other fruit tests and indications are that the Premier and Warfield are best suited to the Mountain

section.

8. Apple Pruning and Training. This experiment was started in 1919 in order to determine the effect of the amount of annual pruning on earliness of bearing and productivity. The following table will bring out the value of light pruning:

Average Yield in Bushels per Tree
1929

Variety	Heavy Pruning	Medium Pruning	Light Pruning
Rome	.94	1.00	2.10
Winesap	1.30	1.78	2.29
Stayman	2.70	4.95	5.34
Delicious	1.90	3.89	7.06

9. Apple Storage. The storage experiments are conducted in the air cooled apple storage house which was constructed in 1926. The temperature and humidity records indicate that if the house is given consistent attention that good storage conditions can be maintained.

10. Apple Fertilizer Tests. The test was started in 1924 for the purpose of determining the effect of different fertilizer elements, alone and in combination, on growth and yield of the apple. Due to the natural richness of the soil at this Station, no very marked differences in growth are apparent so far that may be ascribed to fertilizer applications.

11. Irish Potato Breeding. Ten thousand Irish potato seedlings were planted this past spring. These seedlings are studied with the view of finding a variety or strain superior to our common varieties in regard to yield and disease resistance.

AGRONOMY

In co-operation with the N. C. Experiment Station.

12. Soil Fertility Tests. The results of the soil fertility tests at this Station have shown that phosphoric acid is first and nitrogen the second limiting factor in the production of corn, wheat and Irish potatoes. Omission of the potash has had least effect in decreasing yields.

13. Sources of Phosphoric Acid. When used in equal amounts in a complete fertilizer under wheat, superphosphate and Duplex basic slag proved of equal value. Rock phosphate was second, and soft phosphate the poorest source.

14. Crop Rotation. This experiment is being conducted on Porter's loam (upland soil). A study is being made of continuous cropping of corn and wheat in comparison with a two-year rotation of corn and wheat, grown without a legume for soil improvement, and grown with a legume; and a three-year rotation of corn, wheat and red clover. Results with corn on the unlimed soil for 1928 showed a gain of 31.1 per cent in yield in the two-year rotation without a legume over the continuous cropping, and a gain of 114.4 per cent in favor of the two-year rotation with a legume. Corn in the three-year rotation on the unlimed soil gave an increase in yield of 142.8 over this crop grown continuous on the same land, and an increase of 13.2 per cent over a two-year rotation with a legume. On limed soil this crop in a two-year rotation without a legume showed an increase in yield of 30 per cent over when grown continuously on the same land, and in a two-year rotation with a legume a gain of 66.4 per cent over continuous cropping. This crop in a three-year rotation with a legume showed an increase of 66.9 per cent in yield over continuous cropping and a gain of 0.22 per cent over a two-year rotation with a legume.

15. Soybean Varieties. Of the many varieties tested at the farm, the Herman, Southern Prolific and George Washington were the best seed producers. The best hay varieties were found to be Laredo, Herman and Virginia.

16. Date of Seeding Wheat. In this test plantings of wheat have been made every fifteen days from September 15 to November 15. The results show that October 10-15 is the best time for seeding wheat in this section.

17. Corn Selection. Some valuable data has been secured on the importance of field versus bin selection of Biggs Improved seed corn. The field selections of seed corn resulted in much larger yields of corn and a larger number of two ear stalks.

18. Rye. In comparing the value of Common and Rosen rye for this section, the tests so far show a slight difference in yield in favor of Rosen.

19. Burley Tobacco. In co-operation with the U. S. Department of Agriculture and the Tobacco Station at Oxford, N. C.

As a result of the increased interest in growing tobacco in this section, the Station has added this crop to its experimental program. The plantings consist of twenty-four fertilizer plats, and five (Burley) varieties. The results of the first year's test show that phosphoric acid is the most essential plant food needed.

DAIRYING

Co-operating with Dr. C. D. Grinnells,
N. C. Experiment Station.

20. Dairy Herd Development. This project is attracting the

interest of the dairy people of Western North Carolina. The North Carolina Dairy Ration, which has resulted from the feeding experiments, is now being mixed and sold by one of the leading milling companies in the State. The County Agents are also advocating the North Carolina Dairy Ration.

21. Dairy Pasture Management Studies. This is a study of intensive grass-land management under Western North Carolina conditions. The pasture is covered with an excellent sod, and it is being divided into five three-acre plots. The plots are all similar in soil type and topography.

Four plots will receive varied fertilizer treatments, the application of which was started on March 1, 1930.

The herd are divided into groups:

Group 1 - - High Producers.
Group 2 - - Low Producers.
Group 3 - - Dry Cows and Heifers.

Each plot will be grazed by Group 1 until the choice vegetation is removed. Then Group 2 follows and grazes each plot until Group 1 is removed from the next plot. Group 2 is then followed by Group 3 which continues until the next cycle or trip around.

POULTRY

In co-operation with N. C. Experiment Station.

22. The poultry feeding and breeding experiments are being continued along similar lines as in previous years. The poultry feed formula resulting from the feeding tests is now being used by most of the poultrymen of this section. Two milling companies are manufacturing our feed formula under the name of the North Carolina Poultry Ration, which they are selling as commercial feed.

23. Cost of Producing Eggs. This data is published in Experiment Station Bulletin No. 254 on "Cost of Producing Eggs with S. C. White Leghorns and the Control of Roup and Its Effect upon Egg Production."

SWINE.

24. Cost of Raising Pigs to Weaning Age.

Published in Experiment Station Bulletin No. 272.

25. The Family Sow. Records are kept on this project covering cost and maintenance and returns.

IMPROVEMENTS.

The new concrete block auditorium is proving very popular

and is filling a real need in handling meetings at the Station. The building is also used for curing tobacco.

An additional room has been added to the York and Rhodes' houses and sewer and water lines have been connected to all houses including the dairy plant. Eight acres of new ground have been cleared and brought into cultivation during the past two years.

Respectfully submitted,

F. E. Miller,

Director, Test Farms.

Hon. William A. Graham,
Commissioner of Agriculture,
Raleigh, North Carolina.

Dear Sir:

I beg to submit herewith the report of the Analytical Division for the two years---January 1, 1929--December 31, 1930:

ANALYTICAL DIVISION

The work of this Division consists primarily of the analyses of fertilizers, feeds and insecticides. The sale of each of these products is covered by a regulatory law, the principal object of which is to show the consumer the exact value expressed in chemical terms of the various brands of each offered upon the market. This is accomplished by requiring the manufacturer to brand upon all packages the percentages of active ingredients.

In compliance with the inspection provision of these laws, large numbers of samples are drawn from all parts of the State by official inspectors. These samples are analyzed in the laboratory as rapidly as possible. The analyses are then mailed to the interested parties and published in the Bulletin of the Department, where they are shown in comparison with their guarantees. In addition to the samples drawn by inspectors, many miscellaneous samples are handled for consumers, such as fertilizers of all kinds, limestones, marls, mineral waters, etc. Much time has also been devoted to the problems of individual farmers.

During the past few years a number of changes have taken place in the fertilizer industry, especially in regard to nitrogen products. The plan of introducing either anhydrous or liquid ammonia directly into superphosphate has been developed on a commercial scale. This produces a material containing both phosphoric acid and nitrogen, which appears to give satisfactory field results.

As soon as laboratory methods are perfected for measuring the availability of the phosphoric acid compounds which have been formed by this treatment, it is most likely that the process will come into very general use, with the result that the price of mineral nitrogen will be brought to lower levels, on account of reduced cost. The old forms of organic nitrogen are rapidly disappearing from the market and the new ones are being used in lower percentages.

All mixed fertilizers containing nitrogen are tested in the laboratory for the quality of their organic nitrogen, and, with very few exceptions, are found to measure up to the required standard.

The question of chlorine in tobacco fertilizers has been quite active recently, especially during the spring of 1929, when a number of samples were found to contain an excessive amount. However, during the past season the amount of chlorine decreased considerably, and the results of the tests that were made for this element were on the whole, very gratifying.

The manufacturers, as a rule, are staying approximately within the limits prescribed by the agronomists--that is 2.00 per cent chlorine.

The main developments in the feed control work during the past two years have been principally in connection with the increasing use of added mineral supplements as ingredients of mixed feeds. As our knowledge of nutritional requirements has developed, the use of mineral ingredients has increased. There has been a tendency on the part of some manufacturers to overdo the matter and add such mineral ingredients to an extent not warranted by our present knowledge. It has been found necessary to exclude certain minerals, particularly rock phosphate, as it seems to be well established that the fluorine content of rock phosphate is highly deleterious. Also mineral ingredients are not allowed in poultry scratch feeds, as it is cheaper for the feeder to provide oyster shell, etc. separately.

As usual, quite a number of new by-products of both plant and animal origin have come into common use as components of mixed feeds. Each such new product presents a different problem.

The spirit of cooperation on the part of the manufacturers has become even more marked, and upon the whole, the feed law seems to have been more fully complied with than ever before.

There have been no particular developments in the insecticide work. All samples, both those drawn by inspectors and those sent in by consumers, have been analyzed promptly. As a rule the reports have been most favorable. There still seems to be a lot of old materials, whose manufacturers are no longer in business, scattered in small lots throughout the cotton-growing sections of the State. The most prominent of these is a mixture of calcium arsenate, molasses and water, which has been off the market for some years, so far as the manufacturers are concerned. A number of samples of this material were sent in for analysis. The reports were not favorable.

As a rule, the samples of fertilizers, feeds and insecticides, which have been analyzed during the past two years have compared favorably with their guarantees and the quality of the materials used therein, with few exceptions, has been good.

Since the last biennial report this Division has lost the services of three valuable and experienced chemists, who have found more lucrative employment in commercial work.

The amount and kind of chemical work performed in the laboratory during the past two years is shown in the following summary of analyses:

Official Fertilizers	7309
Fertilizers and Fertilizer Materials for Farmers	260
Official Feeds	1013
Miscellaneous Feeds	133
Insecticides	148
Cotton-Seed Meals	520
Limes and Marls	49
Miscellaneous	87
Total	9519

It may be of interest to know that the above analyses represent more than sixty-three thousand (63,000) quantitative determinations.

Respectfully submitted,

W. G. HAYWOOD,

Head, Analytical Division.

November 1, 1930.

Hon. W. A. Graham, Commissioner,
Department of Agriculture,
Raleigh, North Carolina.

Dear Sir:

I beg leave to transmit herewith the Biennial Report of the Botany Division of the North Carolina Department of Agriculture, covering the period from July 1, 1928 to July 1, 1930. This report includes the North Carolina Pure Seed Law as revised by the last General Assembly, being Chapter 194, Public Laws of 1929: and Chapter 325, pertaining to the production of certified seed in North Carolina.

Respectfully submitted,

J. L. Burgess

Botanist in Charge.

BIENNIAL REPORT OF THE
DIVISION OF BOTANY

1930

- - - - - -

BIENNIAL REPORT OF THE DIVISION OF BOTANY
JUNE 30, 1928 to JUNE 30, 1930

- - - - - -

The Division of Botany of the Department of Agriculture is charged with the following lines of work:

FIRST. The examination and testing, for purity and germination, of field, garden, flower, tree, and herb seed.

SECOND. The identification, study, and control of noxious weeds.

THIRD. The manufacture and distribution of pure nitrocultures for the inoculation of the seeds of the different legume crops.

FOURTH. The placing of commercial grades on grains and soybeans.

FIFTH. Recleaning and treating tobacco seed.

NOTES ON THE STATE SEED LAW

The North Carolina State Seed Law was enacted for the purpose of promoting the use of better seeds among the farmers to the end that the farms of the State might produce greater yields of better crops at less cost, and for protecting agriculture against fraudulent practices on the part of the seed trade.

In its operation the law enables the dealer to secure good seed by having samples of a prospective purchase tested before the purchase is made: it protects the farmer against the purchase of poor seeds by enabling him to have his seeds tested in the State Seed Laboratories in order to check statements made by the dealer; and the public by protecting its food supply against being reduced by crop failure due to the use of poor seed.

Any citizen of the State can have his seed tested in the

State Seed Laboratories free of charge, but a charge of twenty-five cents is made for each purity and each germination test when done for parties living outside the State.

The North Carolina State Seed Law does not in any way interfere with the freedom of contract as any farmer can purchase seeds of any degree of purity and viability he may choose PROVIDED the dealer writes in the face of the State Seed Tag all the facts about which the farmer may care to know, such as the per cent of purity, viability, and the date tested. THE DEALER MUST SEE THAT THE FARMER KNOWS WHAT HE IS PURCHASING AT THE TIME THE PURCHASE IS MADE.

The law provides that every package of seed weighing ten pounds or more, sold to a farmer for seeding purposes, shall have attached to it a State Seed Tag showing all the facts above mentioned. Of course, the Commissioner of Agriculture has the power to withdraw from sale any seeds he finds entirely unfit for planting, as well as all seeds when sold in violation of law.

All seeds sold in the State by seed dealers must be sold under authority of license in the name of either the retail dealer or the wholesale dealer. In case of a retail dealer selling seeds without license, he must sell ONLY THOSE SEEDS which he has purchased from a wholesale house that HAS LICENSE TO SELL SEEDS IN THIS STATE. In case of a wholesale house selling seeds in North Carolina, it must sell under a license taken out in its own name or sell to only those retailers who do have a license to do a seed business in North Carolina.

Section 18 of the State Seed Law permits dealers to use the term "Standard Seed" only in case the face of the State Seed Tag shows a percentage of purity and germination equal to that required in said section.

The last Legislature made some revisions in the State Seed Law, which became effective on January 1, 1930. A new section, Section 6, was added to the law. This section deals with "Noxious Weeds", and Section 2 (c) requires that the per cent of "noxious weed seeds" shall be shown in the face of the State Seed Tag as provided for in Section 18 of the new act.

For the past several years the Department of Agriculture has been encouraging the production of pure-bred and higher-yielding strains and varieties of crop seeds in North Carolina in order that our farmers might the more successfully cope with the difficulties incident to buying seeds from other states, which seeds might not be adapted to our soils and climate, or otherwise suited to the local agricultural needs of the State. The last Legislature, through the influence and activities of the Commissioner of Agriculture and others, enacted Chapter 325, providing for the production and certification of crop seeds for North Carolina farmers. The Department of Agriculture is largely financing

this movement for the production of better crop seeds and is co-operating with the College in carrying out the provisions of the law. The Commissioner of Agriculture is an ex officio member of the Board having executive supervision of and control of the production and distribution of pure crop seeds in the state. The Pure Crop Seed Act was in force from and after its ratification.

For some years past complaints have come to the department, stating that certain misbranded seeds have been placed on the market and that much damage has been done the agriculture of the state by the use of these misbranded seeds. The Commissioner of Agriculture has generally been unable to run these shippers to cover on account of some missing link in the chain of evidence necessary to bring them into court. Recently, however, he has been able to secure what appears to be valid evidence against certain out-of-the-state shippers of misbranded seeds and hopes to stop this illegal and ruinous traffic in bad seeds at an early date.

SEED LABORATORY

There have been received and tested in the seed laboratory the past two years a total number of seed samples amounting to six thousand and nine hundred and eighty-two (6,982).

TOBACCO SEED.

The months of December, January, and February are largely given over for the recleaning of tobacco seed sent to us by the farmers. The past two years we recleaned 1,466 lbs. and 6 oz. for 834 farmers.

SEED TAGS.

The past two years we distributed three hundred eighty-two thousand, and twenty-four (382,024) seed tags to 227 licensed dealers.

NITRO*CULTURES.

The distribution of pure cultures for legumes the past two years was 3,233 acre bottles.

PLANT IDENTIFICATION.

A great many plants have been identified the past season, some persons sending in great bunches at once. We have had to give considerable time to this phase of our work. More attention is being given to the identification of drug plants and plants poisonous to livestock.

GRAIN GRADING.

Since our grain-grading service was established we have had six-hundred and thirty-six (636) cases of disputed shipments of wheat, corn, and oats submitted to us. Some of these cases involve large sums of money, and before this service was established the millers of the State sustained much loss in the acceptance of inferior grains from distant shippers.

It must not be assumed that in every case a seedsman is selling seeds of low viability because our report shows his seed had a low percentage of germination, because many dealers send us their old left-over seeds in order to ascertain their value for the current year's trade. Of course, seeds of low vitality may be offered for sale, but the farmer should always demand the analysis, showing the quality of the seed, to be placed on the tag. Then the farmer should always send the State Seed Laboratory a small sample as a check on the seedsman's guarantee as shown on the seed tag.

SOY BEAN INSPECTION

For the past three years the Botany Division of the Department has maintained an inspection laboratory at Washington, N. C., for the purpose of placing commercial grades on shipments of soy beans at that and other points in the Coastal Plains section of the State. The demand for this work has been gradually falling off, only forty-nine cars having been inspected here last season, and this season it was deemed better, and easily possible, to do the work in the central laboratory at Raleigh that had formerly been done at the Washington laboratory.

For the past three years the Department of Agriculture has been promoting the production of certified seed potatoes in the mountain section of the State. The farmers and dealers have taken much interest in this work and there is now every indication that the work is on a firm footing and will remain an essential feature of the agricultural development of this part of the State.

This year a number of farmers in Ashe, Watauga, and Avery Counties produced hundreds of bushels of very high-grade potatoes, many of which were eligible to certification, and, since prices were much better than last year, are highly pleased with results obtained. This is a new industry for North Carolina following, as it has, the discovery that soil and climatic conditions in this part of North Carolina are ideal for the production of seed Irish potatoes of the highest quality and with an earliness of maturity equal to that of potatoes grown in either Maine or Michigan, and, of course, some 1500 miles nearer the point of consumption.

CHAPTER 194

AN ACT TO AMEND THE STATE PURE SEED LAW, ART. 12, VOL. 2, CONSOLIDATED STATUTES

THE GENERAL ASSEMBLY OF NORTH CAROLINA DO ENACT:

Section 1. That the term "agricultural seed" as used in this act shall include the seeds of all domesticated grasses, cereals, clovers, vetches, alfalfas, peas (except garden peas), beans (except garden beans), and seeds of all other crops that are or may be successfully grown in North Carolina on field scale; while the term "vegetable seed" shall include the seeds of those crops that are generally grown in North Carolina on garden scale and generally known and sold under the name of "vegetable seeds."

Section 2. Every parcel, package, or lot of agricultural seeds, as defined in section one of this act, offered or exposed for sale in this State, for use within the State, shall have affixed thereto, in a conspicuous place on the outside thereof, distinctly printed in the English language in legible type, a State tag certifying:

(a) The commonly accepted name of such agricultural seeds.

(b) The approximate per cent by weight of purity, meaning the freedom of such agricultural seeds from inert matter and from other seeds distinguishable by their appearance.

(c) The approximate per cent by weight of common weed seeds, noxious weed seeds and other agricultural seeds designated in sections four and five of this act.

(d) The approximate per cent of viability, together with the month and year said seed were tested for viability.

(e) In case of seeds produced within the United States, the State in which seeds were grown, when known, must be shown on the tag.

(f) Full name and address of the seedsman, importer, dealer, agent, or other person or persons, firms or corporations, selling, offering or exposing for sale or for distribution such agricultural seeds in the State for seeding purposes.

Section 3. The term "inert matter" as used in this act shall be understood to include sand, dirt, chaff, and other foreign substances, and broken seed incapable of germinating.

Section 4. The term "other agricultural seeds" as used in this act shall be understood to include all agricultural seeds not of the kind or species named on the package.

Section 5. The term "common weed seeds" as used in this act shall be understood to include seeds of the plants commonly known as wild mustard, Canada thistle, wild carrot, curled dock, sheep sorrel, black mustard, common plantain, bracted plantain, buckhorn, henbit, chickweed, crabgrass, and seeds of all other plants which commonly occur in a wild state.

Section 6. That the term "noxious weed seeds" shall be applied to seeds of wild onion or wild garlic, all dodders, corn cockle, and cheat or chess.

Section 7. Mixtures, when in bulk, packages, or other containers, offered or exposed for sale within the State, for seeding purposes, containing two or more kinds of agricultural seed shall have affixed thereto in a conspicuous place on the exterior of the container of such mixture a plainly written or printed tag or label in the English language, stating:

(a) That such seed is a mixture.

(b) The name, kind of each seed entering into the mixture.

(c) The approximate percentage by weight of inert matter.

(d) The approximate percentage by weight of weed seeds, and other agricultural seeds, as defined in sections four and five of this act.

(e) The full name and address of the seedsman, importer, dealer or agent, or other person or persons, firms or corporations, selling or offering or exposing for sale or distribution such mixtures in this State for seeding purposes.

Section 8. No statements regarding the quality of such agricultural seeds, or mixtures, if inconsistent with the requirements of this act, shall be written or printed on the tag or label, or placed inside or affixed to any container or bulk of agricultural seed or mixture sold, offered or exposed for sale or distribution within the State for seeding purposes.

Section 9. No standard of purity shall be maintained for vegetable seeds, but each package must show on the tag or label the exact nature of its contents.

Section 10. It shall be unlawful for any person, firm, or corporation to sell, offer or expose for sale or distribution within the State any agricultural or vegetable seeds, or mixtures of agricultural and vegetable seeds as defined in this act for seeding purposes, without complying with the requirements of this act, or to falsely mark or label as to variety or kind any agricultural or vegetable seeds, or to interfere in any way with the inspectors or assistants in the discharge of the duties herein named.

Section 11. The duty of enforcing this act and carrying out its provisions and requirements shall be vested in the Commissioner of Agriculture. The Department of Agriculture shall adopt such rules and regulations as may be necessary to secure the efficient enforcement of this act; and shall maintain a seed laboratory with necessary equipment.

Section 12. Seed not having a reasonable viability, or that are extremely impure, notwithstanding they may be properly labeled, shall be withdrawn from sale when, in the opinion of the Commissioner, such withdrawal is in the interest of normal crop production.

Section 13. It shall be the duty of the said Commissioner, either by himself or his duly authorized agents, to inspect, examine, and make analysis of and test any agricultural or vegetable seeds sold, offered or exposed for sale or distribution within the State for seeding purposes, at such time and place and to such extent as he may determine. The Commissioner or his agents shall have free access, at all reasonable hours, upon and into any premises or structures to make examination of any agricultural seeds, whether such seeds are upon the premises of the owner or consignee of such seeds or on the premises or in the possession of any warehouse, elevator, railroad or steamship company; and he is hereby given authority in person, or by his analysts, inspectors, or assistants, upon notice to the dealer, his agent, or the representative of any warehouse, elevator, railroad, or steamship company, if present, to take for analysis a composite sample of such agricultural or vegetable seeds from a parcel, package, or lot or other container, or number of parcels, packages, lots, or other containers. Said sample shall be thoroughly mixed and divided into two samples of at least two ounces each and securely sealed. One of said samples shall be left with or on the premises of the vendor, or party in interest, and the other retained by said Commissioner, or analyst or agent, for analysis.

Section 14. It shall be the duty of the Commissioner of Agriculture to publish, or cause to be published, at the end of the year, the results of the examinations and tests made of any samples of agricultural or vegetable seeds, or mixtures of agricultural seeds, received from private individuals, or drawn as provided for in section twelve, together with any other information he may deem advisable: PROVIDED, that the rules for analyses shall conform to the best known methods of examining and testing agricultural and vegetable seeds.

Section 15. Every violation of the provisions of this act shall be deemed a misdemeanor and punishable by a fine not to exceed one-hundred dollars, and if the Commissioner shall find, upon examination, analysis, or test, that any person, firm, or corporation has violated any of the provisions of this act, he or his duly authorized agent or agents may institute proceedings

in a court of competent jurisdiction to have such person, firm, or corporation convicted thereof; or the Commissioner, in his discretion, may report the results of such examination to the Attorney-General, together with sworn statement of the analyst, duly acknowledged, and such other evidence of said violation as he shall deem necessary. Said sworn statement shall be submitted as evidence in any court of this State in any proceeding instituted under this act; but, upon a motion of the accused, such analyst shall be required to appear as a witness and be subject to cross-examination: PROVIDED, however, that no prosecution for violation of this act, if such violations are based on tests or analyses, shall be instituted except in the manner following: When the Commissioner of Agriculture finds that this act has been violated, as shown by test examination or analysis, he shall give notice to the person or firm in whose hands the seeds were found, designating a time and place for a hearing. This hearing shall be private, and the person or firm involved shall have the right to introduce evidence, either in person, by agent or attorney. If, after said hearing, or without said hearing in case said person fails or refuses to appear, the Commissioner decides that the evidence warrants prosecution, he shall proceed as herein provided. Moreover, it shall be the duty of the Attorney-General, or, in his discretion, he may act through the attorney of the county or city in which said violation has occurred, to institute proceedings at once against the person or persons, firms, corporations charged with such violation: PROVIDED, such proceedings for violations shall be instituted according to the laws of this State.

Section 16. Any citizen, firm, or corporation of this State shall have the privilege of having samples of seeds tested free of charge in the State seed laboratory; while individuals, firms, and corporations outside the State shall have a like privilege on payment of a fee of twenty-five (25) cents for each purity test and twenty-five (25) cents for each germination test.

Section 17. For the purpose of providing a fund to defray the expenses of the examination and analysis prescribed in this act, each person, firm, or corporation selling or offering for sale in or for export from this State any seed as mentioned in this act shall register with the Department of Agriculture the name of the person, firm, or corporation offering the seed for sale, and shall pay a license tax annually, on January first of each year, of twenty-five dollars ($25). The Commissioner's receipt for such money shall be license to conduct the business.

Section 18. That every parcel or package of agricultural and vegetable seeds, as defined in this act, delivered to any farmer of this State for seeding purposes, and weighing ten (10) pounds or more, sold by any person, firm, or corporation whose business residence is either inside or outside the State, shall have affixed thereto a copy of the tag as designated in section two of

this act; said tag to be purchased from the Commissioner of Agriculture, and the purchaser of said tag to be subject to the penalty outlined in section 15 for the use of the same tag a second time: PROVIDED, that tags of the previous year may be given in exchange for tags of the current year.

Section 19. That any grower or dealer who may desire to use the term "Standard Seeds" in describing his goods may do so provided such seeds measure up to the following percentages of purity and germination:

STANDARDS OF PURITY AND VIABILITY

Name of Seed	Per Cent Purity	Per Cent Germination
Alfalfa	98	80
Asparagus		80
Barley	98	90
Bluegrass, Kentucky	80	45
Bluegrass, Canada	90	45
Buckwheat	99	90
Brome Grass	90	75
Cabbage		90
Carrot		80
Cauliflower		80
Celery		60
Clover, Alsike	95	80
Clover, Crimson	98	90
Clover, Red	98	90
Clover, White	95	80
Collards		80
Corn, Field		95
Corn, Sweet		90
Cotton		90
Cowpea		90
Cucumber		90
Egg Plant		80
Fescue, Meadow	95	85
Kaffir Corn	98	90
Lettuce		90
Melon, Musk		90
Melon, Water		90
Millet, Pearl	98	90
Millet, Common	96	85
Oats	99	90
Okra		85
Onions		85
Oat Grass	72	70
Orchard Grass	70	70

Name of Seed	Per Cent Purity	Per Cent Germination
Rape	99	90
Red Top	90	80
Rye	99	95
Rye Grass, Perennial	96	80
Rye Grass, Italian	95	80
Sorghum	96	80
Sudan Grass	96	75
Spinach	--	85
Squash	--	90
Timothy	98	90
Tomato	--	90
Turnip	--	90
Tobacco	--	80
Vetch	98	70
Wheat	99	95

PROVIDED, that nothing in this act shall be construed to require a farmer selling seeds raised by himself to comply with the provisions hereof.

Section 20. That this act shall be in force from and after January first, one thousand nine hundred and thirty.

Section 21. All laws and clauses of laws in conflict herewith are hereby repealed.

Ratified March 16, 1929.

CHAPTER 325

AN ACT TO FOSTER THE DEVELOPMENT AND PRODUCTION OF PURE-BRED CROP SEEDS IN NORTH CAROLINA AND PROVIDE FOR THE CERTIFICATION THEREOF.

Whereas, the State of North Carolina is a leading agricultural State with a large percentage of it engaged in the production of farm crops; and

Whereas, the farmers of North Carolina have, in the past, experienced great difficulty in producing or otherwise procuring good and reliable seeds of the proper varieties of crops best adapted to their soils and climatic conditions, resulting in reduced and inferior production at increased cost; and

Whereas, the quantity, quality, and marketability of the crop produced depend vitally on the kind and quality of seed planted; and

Whereas, the breeding and adaptability of farm crop seeds are difficult to determine unless said seeds are certified and appraised by a publicly supervised organization; and

Whereas, the certification of seed is the farmers' best guarantee as to variety, breeding, quality and adaptation; and

Whereas, Governor Gardner has urged in his inaugural message the production and distribution of pure-bred crop seeds for the farmers of North Carolina; and

Whereas, the development and production of pure-bred crop seeds and the fostering of the distribution and certification of said seeds is a natural function of the Agricultural College and State Department of Agriculture co-operating; now, therefore,

THE GENERAL ASSEMBLY OF NORTH CAROLINA DO ENACT:

Section 1. That there is hereby created in the Agricultural Extension Service of the State College of Agriculture and Engineering a division to foster and promote the development and distribution of pure strains of crop seeds among the farmers of North Carolina. The Director of said Division shall be selected as the heads of other divisions of the State College of Agriculture and Engineering are selected and said division shall have the necessary co-operation of all other members of the college staff of said State College of Agriculture and Engineering for the proper carrying out of the purposes of this act.

Section 2. The Governor, the Commissioner of Agriculture, and the Dean of the School of Agriculture of the State College of Agriculture and Engineering are hereby created a State Board of Farm Crop Seed Improvement.

Section 3. The said board shall have control, management and supervision of the production, distribution and certification of pure-bred crop seeds under the provisions of this act.

Section 4. In so far as any of the State departments or agencies shall have to do with the testing, development, production, certification and distribution of farm crop seeds, such departments or agencies shall actively co-operate with the said Board in carrying out the purposes of this act. The said Board shall have authority to make, establish and promulgate all needful rules and regulations, including rules and regulations fixing fees for certification and fixing the market price of certified seed, necessary for the proper exercise of the duties conferred upon said Board and for the carrying out the full purposes of this act.

Section 5. For the purpose of carrying out more fully the provisions of this act and of fostering the development, certification and distribution of pure seeds the said Board shall have authority to promote the organization and incorporation of an association of farmers to be known as the North Carolina Crop Improvement Association, which said association when so organized and incorporated shall, subject to the rules and regulations prescribed by said Board, adopt all necessary rules and regulations and collect from their members such fees as shall be necessary for the proper functioning of such organization.

Section 6. For the purposes of this act the certification of crop seeds hereunder shall be defined to be a guarantee by the North Carolina Crop Improvement Association herein provided for that the said seed conform to the stated origin, adaptation, variety name, variety purity, quality, germination, seed purity, and any other qualification necessary for the determining of the proper quality or value of crop seed.

Section 7. Certification of crop seeds in so far as it concerns the origin, adaptation, variety name, variety purity and quality shall be subject to the supervision of the director of the Division of Farm Crop Seed Improvement. Certification of crop seeds in so far as it concerns germination and purity tests shall be subject to the supervision of the State Department of Agriculture. The North Carolina Crop Improvement Association may certify any crop seeds when the certification thereof shall have been approved by both the director of the Division of Farm Crop Seed Improvement and the State Department of Agriculture.

Section 8. That for the purposes of aiding in meeting the expenses necessary for the carrying out of the provisions of this act there is hereby appropriated out of any unexpended and unappropriated portion of the Agricultural Fund the sum of three thousand dollars ($3,000) for the remainder of the present fiscal year, and the further sum of five thousand dollars ($5,000) per year for each year of the incoming biennium.

Section 9. That all laws and clauses of laws in conflict with the provisions of this act are hereby repealed.

Section 10. That this act shall be in force from and after its ratification.

Ratified March 19, 1929

VETERINARY DIVISION.

To the Commissioner of Agriculture:-

I herewith submit the biennial report of the Veterinary Division, covering the period from December 1, 1928, to December 1, 1930.

Wm. Moore,
State Veterinarian.

TICK ERADICATION.

Dipping was continued on the Banks of Hyde and Dare Counties where reinfestation occurred in 1928, up to December 20,1929, at which time dipping was discontinued and this section was released from quarantine.

In August 1930, cattle ticks were found on a farm in Sampson County near the Duplin County line. Further inspection revealed infestation on other nearby farms. Ticks were also found on three premises in Duplin County and one in Harnett County, as a result of moving ticky cattle from Sampson County. Sampson County was released from quarantine in 1915. Since that time numerous inspections have been made in this, as well as other counties, for the purpose of locating any infestation. From the information received it would seem that this reinfestation is a result of the unlawful movement of cattle from Onslow County a few years ago when this county was under quarantine. As soon as these ticks were found the U.S. Bureau of Animal Industry was notified and they promptly sent inspectors to the County. A state inspector was employed and all infested premises were placed under quarantine. The situation was reported to the Boards of Commissioners in the three counties and immediate arrangements made to build vats. All infested cattle were dipped during September, this will continue until cold weather and dipping will be taken up next spring. It will be necessary to make a farm to farm inspection of all cattle in a large surrounding area where these ticks were found. By inspection, quarantine and dipping we will be able to eradicate the ticks.

BOVINE TUBERCULOSIS ERADICATION.

Although the tuberculin testing of all cattle, in all of the counties of the State, was completed October 1, 1928, it has been necessary to test a considerable number of cattle in order to insure against the invasion of this disease. This testing has been done in state owned herds (21) the herds of charitable institutions, herds in which cattle have been imported, previously infected herds and certain herds in counties in which the three year accreditation period has expired. Splendid cooperation with the U.S. Bureau of Animal Industry has been maintained.

HOG CHOLERA AND SWINE PARASITES.

No serious outbreaks of hog cholera have been reported, although the disease has been more or less prevalent in many sections. The promiscuous use of virus and the purchasing of new animals continue to be the chief causes of the spread of this disease.

The plan of controlling cholera by quarantine and sanitation, without the use of virus, in an area comprising Beaufort and Hyde Counties, first approved by the Board at the December 1928 meeting and again at the July 1929 meeting, has been continued with gratifying results. Considerable delay and trouble was experienc-

ed in the beginning of the present fiscal year in obtaining a suitable inspector to conduct this work at the salary allowed. This obstacle has been partly removed and we now have a very satisfactory inspector (Dr. A. J. Osteen) who is doing a splendid piece of work. On July 10, 1930, Dr. Osteen received a severe infection as a result of making a post mortem examination of a pig. It finally became necessary to send him to a hospital where he remained for a month. He returned to his duties in September, but continues to suffer from an infection of the glands of his left arm.

More than 50 farms in the territory have been visited for the purpose of determining the cause of sickness among hogs. In nearly all of these it was found that internal parasites, pneumonia or gastro-enteritis was the cause of the trouble. Sanitation and proper feeding was applied to remedy these conditions and excellent results were obtained. Improper diagnosis and use of virus in these cases would have undoubtedly started outbreaks of cholera. No serious outbreaks of cholera have occurred in the territory although under the old system in the past outbreaks have been numerous and losses heavy.

Pig clinics have been held at every point in the territory where a group of farmers could be brought together. At these clinics pigs brought by the farmers were killed and a post-mortem examination made to show them the different parasites that affected pigs, the damage done by these parasites and the methods of control were fully explained. Visits have been made to a majority of the farms in the territory where hogs are raised in order to make personal contact with the farmer and interest him in the work. A large number of farmers have raised their spring pigs under the swine sanitation system. Records are being kept on these and also a record on previous litters not raised under the system. These will be compared when all of the hogs have been marketed.

Some work outside the territory in Washington and Tyrrell Counties has been conducted - one week and three days in Washington and two weeks and three days in Tyrrell. Pig clinics have been held in every place advisable in these two counties. Five outbreaks of cholera have occurred in Washington and one in Tyrrell County. At the urgent request of the Board of County Commissioners of Washington County this territory was extended to include Washington County on June 1, 1930. A survey has been made with a view to putting in operation the plan of controlling cholera and parasites as used in Beaufort and Hyde Counties. The Board of County Commissioners of Tyrrell have requested by resolution that this work be extended so as to include Tyrrell County. We have only one inspector to look after the work in the three counties which are now being worked.

I am of the opinion that this is one of the most important pieces of work that we have ever undertaken and that this work is essential for the future welfare of the swine industry in eastern Carolina. We have had numerous requests to extend this work

to additional territory, but this is impossible with the present personnel.

ANIMAL PARASITES.

Recently a questionnaire was sent to all veterinarians in the State who do meat inspection for their local communities, for the purpose of obtaining information regarding the prevalence, extent and approximate loss in meat producing animals slaughtered, from parasites. A summary of the information obtained follows:

Number of hogs slaughtered and inspected - -	81,863
Number of cattle slaughtered and inspected -	32,092
Number of sheep slaughtered and inspected -	6,358
Number of above animals shipped in from other states - - hogs - 33,300 - -cattle - -	8,775
Number of animals (hogs,cattle, sheep, condemned on account of internal parasites - - - - - - - -	368
Number of livers (mostly from hogs) condemned	25,172
Number of kidneys (hog) condemned - - - - - - -	11,580
Number of lungs (hog) condemned - - - - - - - -	2,715

The results of this survey indicated above, clearly show that internal parasites are very prevalent among our farm animals and while the loss from condemned animals and parts is a considerable amount, it is small compared with the premature death of animals on the farm and the failure to make proper gains from the feed consumed, as a result of infestation with internal parasites.

At the request of this office, a representative of the Zoological Division, U. S. Bureau of Animal Industry, was detailed to the State during March, 1930, for the purpose of making an investigation on parasites in live stock. I quote herewith his report.

"At the invitation of the State Veterinarian of North Carolina, the writer spent 20 days visiting various points in the State of North Carolina with a view to securing information on the prevalence, abundance, distribution, and economic importance of parasites, and parasitic diseases of live stock. Visits were made to abattoirs in Greensboro, High Point, Salisbury, Charlotte, Asheville, Hendersonville, Rocky Mount and Elizabeth City. Several city markets at which carcasses of food animals are inspected by a city meat inspector were also visited. As opportunities for so doing presented themselves, examinations were made of edible portions of the viscera of various food animals for evidence of parasitic infestations and in many instances the alimentary canal and other viscera were slit open with a view to determine the presence or absence of parasites. A number of farms and feeding lots were also visited with a view to securing information from owners regarding losses, especially among young live stock, as a result of conditions suggesting a parasitic origin. Many practicing veterinarians were consulted with regard to their knowledge concerning

occurrence or parasitic diseases in livestock based on clinical evidence. Microscopic examinations of feces for evidence or parasitism was resorted to in a number of instances. Finally, a thorough and systematic canvas of about 15 farms in several counties in the eastern part of the state was made for the purpose of observing conditions under which various classes of livestock, and hogs in particular, are raised, and to appraise the results which have thus far been obtained by the use of the swine sanitation system.

Parasites present in North Carolina livestock.

Nearly all the common parasites of livestock known to occur in the United States are also present in North Carolina, so far as the results of this survey show. Hogs in the state are commonly infested with intestinal roundworms, thornhead worms, stomach worms, nodular worms, lungworms and kidney worms. Microscopic examinations of the feces of calves showed the presence of coccidia and of gastro-intestinal strongyles. The occurrence of lungworm disease in sheep was reported orally to the writer by several veterinarians, and one report called attention to the loss of 18 sheep on one farm as a result of lungworm disease, According to the reports of several veterinarians in the central part of the state, stomach worm disease in calves is of fairly common occurrence, the parasites producing a rather well defined clinical picture of unthriftiness, emaciation, diarrhea and anemia, the symptoms usually clearing up following repeated treatments for the removal of the worms. Examinations of the feces of one lot of 10 calves of varying ages, not above 6 months, however, showed that all of them were rather heavily infested with gastro-intestinal parasites. The animals in question appeared unthrifty and were more or less pot-bellied and undersized. Examinations of the feces of another lot of 14 calves showed that 9 were infested with parasites, and that 6 of these harbored coccidia as well as worms.

Importance of parasitic disease of livestock in North Carolina.

Internal parasitism in swine is an important livestock problem in North Carolina,especially in the eastern part of the state, and will become increasingly important in other parts of the state as the swine population in those parts increase. Intestinal roundworms, which are usually present in association with other parasites, produce considerable stunting and are responsible for numerous deaths among pigs. Kidney worms produce pronounced lesions in the liver, lungs, kidneys, and lumbar muscles, interfere with growth and development, and make swine raising unprofitable in many sections. Lungworms produce pneumonia and it is possible that these, as well as other parasites, weaken a pig's resistance, so that it becomes an easy prey to infectious diseases of various sorts. A large proportion of the condemnations of parts of hogs in various city abattoirs in North Carolina is on account of kidney worm infestation.

It is the opinion of the writer, based on his observations on farms and on interviews with farmers in the eastern part of the state, that internal parasites of swine are the most serious handicap to the swine grower of the state. Parasitized pigs die in large numbers, and those which survive are runty, unthrifty, em-

aciated and, in many instances, unfit for the market.

Parasitism in dairy calves is another important agricultural problem in North Carolina. Such diseases as coccidosis and gastro-intestinal strongylosis produce diarrhea, stunted growth, anemia and emaciation, these symptoms leading in many cases to a fatal termination. Calves which recover from these conditions are not likely to develop into the best type of dairy cows.

RECOMMENDATIONS.

While the writer finds nothing that is particular alarming as regards the condition of livestock in North Carolina, so far as parasitic diseases are concerned, it should be noted that the State, in common with other states, has a parasite problem with which to contend. The recognition that such a problem actually exists is the first step looking towards a solution and it is gratifying to note that Dr. William Moore, the State Veterinarian of North Carolina, is keenly aware of the situation and has the knowledge, the ability and the resourcefulness to deal with it. He has already under way a project of swine sanitation in Beaufort and adjoining counties and the work accomplished thus far not only looks promising, but has already produced results which are highly encouraging. It is recommended that the scope of this work be enlarged to cover additional counties in eastern North Carolina with head-quarters at two additional points, one in the north-eastern part of the state, perhaps at Elizabeth City, and one in the south-eastern part of the state, either at Newbern or Wilmington, or at some other convenient point."

"The problem of control of parasites in calves requires attention in North Carolina and in this connection a cooperative arrangement with several dairies with a view to studying the problem of parasitic control in calves by means of pasture rotation combined with systematic treatment for the removal of parasites appears to be indicated."

(Signed) Benjamin Schwartz,
Senior Zoologist.

Personal investigations and observations lead me to believe that this report briefly covers the situation as it now exists. Internal parasites in cattle, especially young animals, are causing rather heavy losses in many sections of the state. No systematic effort is being made to remedy this situation. I believe that a cooperative project should be undertaken with the Experiment Station to work out a plan for the systematic control and eradication of internal parasites of cattle.

PULLORUM DISEASE CONTROL.

At the July 1929 meeting of the Board a new plan of conducting this work was approved. Heretofore, we had made one annual test on a flock, but under the new plan retests were made every six weeks. This was necessary because it had been determined that a large number of diseased birds were intermittent re-

actors and that many of them would be left in the flock if only one test per season was applied. Funds were made available at the beginning of last season, for another inspector, which made it possible for us to do a greatly increased amount of work. We cooperated with the Poultry Department at State College on this work, they handling a part of the culling, for type and production of the flocks. During the season a total of 279 flocks comprising 43,594 birds were inspected and tested. Flocks were accredited on two negative tests without reactors as follows:

44	flocks	accredited	on 2nd.	test.
68	"	"	" 3rd.	"
89	"	"	" 4th.	"
29	"	"	" 5th.	"

At the end of the season 33 flocks were negative on one test and 16 flocks were still infected.

During the 1929-1930 season a total of 128,467 blood tests were made, 6307 reactors were found. A total of 230 flocks were accredited.

No. 1. During the season 1928-1929 we tested 38,140 birds of which 3220 reacted. A total of 3630 birds were culled as unfit for breeders.

No. 2. Testing in the 1930-1931 season is now in progress. Increased interest on the part of flock owners and hatcheries is being manifest and we have received many more applications than we will be able to take care of.

Pullorum Disease or B. W.D. is very prevalent and is apparently the most serious disease affecting poultry and its control and eradication is, therefore, very necessary. The records indicate that about 95 per cent of chicks from tested flocks were raised this season and about 70 per cent from untested flocks. There continues to be a large number of baby chicks shipped into the State, bought chiefly because they are cheap. Many of these die from Pullorum Disease. Our present plan of work, that is frequent testing, has met with the approval of the hatchery, flock owner and the purchaser of baby chicks wherever it is known and understood. As far as possible we have confined this work to flocks supplying hatcheries that use only eggs from tested flocks. In this way we can do the greatest good in supplying disease free chicks to the buying public.

We have received, and are receiving a much larger number of applications for testing this season than heretofore, about 136,000 birds. If all of these applications materialize it will be impossible for us to take care of the work with the present personnel. It will perhaps be necessary for us to ask for temporary assistance during the height of the testing season. I feel that it is very urgent that we have a full time laboratory technician to do routine laboratory work in order that our regular inspectors

may spend more time in the field on various disease control work. Such a technician need not necessarily be a highly trained person, but one who has had some laboratory training and is able to do routine laboratory work under supervision. I feel that it is important that we provide some facilities for making laboratory diagnosis of outbreaks of disease. At present we must depend upon commercial laboratories or those of the U. S. Department of Agriculture. This, of course, is inconvenient and impractical in many instances. With the technician asked for we can arrange, by adding some additional equipment, to take care of a large part of this work.

From this report it will be noted that 128,467 blood tests on poultry was made and that during the past year 12332 blood samples from cattle were tested for abortion. This involved a large amount of routine work.

At a meeting of all State Veterinarians of the Southeastern States held in Charlotte in June 1930, it was unanimously agreed that these states should adopt a uniform regulation requiring a tuberculin test on mature poultry shipped in. This matter was referred to the Board of Agriculture at the July meeting and they adopted a regulation which became effective September 1, 1930. Investigation shows that tuberculosis of poultry exists to an alarming extent in the west and middle west states. This regulation should prevent the importation of this disease.

BOVINE INFECTIOUS ABORTION.

We have continued to cooperate with the Experiment Station on the project for the control and eradication of this disease, started in 1927. Good progress has been made and much valuable information is being obtained. About 25 herds are included in this project, several are now free from this disease and we hope to have others free in the near future. There has been an increasing demand for assistance in controlling this disease which is now recognized as of great importance economically and is tending to become important from the public health standpoint. In May 1929, a plan was worked out to give herd owners assistance with this disease by arranging to make tests without charge, the owner to have samples drawn by his veterinarian and sent to our laboratory. Many have taken advantage of this and we are working with an increasing number of herds. Arrangements were also made to issue suitable certificates to herds found to be free from this disease on two annual tests. To date 13 certificates have been issued and others will follow. We have also started a systematic campaign to eradicate this disease from the 21 state-owned herds involving more than 1000 cattle. Frequent tests are made and the reacting animals are isolated if valuable as breeders or producers, otherwise they are disposed of by slaughter. Eleven of these 21 herds are now free from this disease, three having been issued certificates. We have received splendid cooperation from the heads of the institutions and from Mr. George Ross, in this work, which to a large extent is responsible for the splendid results we have obtained. From June 1, 1929, to June 1, 1930, we have tested a total of 12332 blood samples in our laboratory for abortion.

MISCELLANEOUS.

We have had a very large number of requests to investigate reported outbreaks of disease. We have been seriously handicapped in taking care of this on account of the greatly increased amount of laboratory work without any increase in personnel. Several rather severe outbreaks of hemorrhagic septicemia in cattle have occurred. These have been satisfactorily handled by vaccination. No anthrax, black-leg, sheep scab or glanders have been encountered, although we are constantly on the look-out for these diseases. We have continued to look after the health of live stock on the 21 state-owned farms and have made considerable effort, with success, to prevent disease among the live stock.

October 30 1930

Mr. William A. Graham,
Commissioner of Agriculture,
Raleigh, N. C.

Dear Sir:

The following is a report of the activities of the Division of Entomology covering the period December 1, 1928 to December 1, 1930.

The Division is charged with various regulatory and control matters pertaining to insects and diseases that affect man, plants and animals. Our activities in this connection covering the past biennium are reported below.

Nursery Inspection Work

There were 158 nurseries certified as free of dangerously injurious insects and diseases in 1929. Several of these nurseries required two or more inspections before they were certified. The inspection fees amounted to $1126.90.

In 1930, a total of 181 nurseries were inspected. Of these 143 have been certified to date, the remainder will be certified upon payment of the inspection fee. In addition to the 181 inspections, 40 nursery properties were inspected which were discontinued during the past year. The fees for this inspection work for this season have thus far amounted to $1011.90.

Frequent inspectional and consultation visits are made by the members of this division to the nurseries, especially the larger ones, during the year. Packing house inspection was done in a small way during the past year and this type of inspection will be emphasized during the forthcoming winter. Packing house inspection permits a more complete examination of the roots of plants.

Two new insect pests of nursery stock were found in several nurseries of this state this year. One of these a beetle known as Pissodes deodarae has been found to be rather destructive at times to deodar cedar trees. Another beetle, Otiorhynchus rugifrons is a pest of western spruce. Approximately two hundred of these plants were plowed up and burned when found infested in one nursery. The insect had evidently been introduced from Massachusetts in 1925.

It is of interest to report that the ornamental and fruit tree nurseries of the state are maintained in unusually good condition. They now comprise approximately 1525 acres.

Permit Tags For Out-of-state Nurseries

A total of 50,620 permit certificate tags was mailed to out of state nurseries during 1929 to 251 nurseries and 35,287 tags have been mailed thus far in 1930 to 203 nurseries. The receipts for these tags have been $668.10 and $486.75 respectively. The tags are priced to out-of-state nurseries at approximate cost. Tags are issued to such nurseries as make shipments into this state, after a duplicate of the inspection certificate of the nursery is filed in the office of this division.

Native Plant Collectors Permits

Collectors and sellers of wild native plants who operate upon a commercial scale are required to hold a plant collectors permit, the annual fee for which is $10.00. Copies of the permits must be printed upon shipping tags and such a tag attached to each gift, sale or shipment of wild native plants. During 1929 a total of 51 such permits was issued. A total of 43 has been issued to date in 1930.

The business of collecting wild native plants and their subsequent transportation to other states has expanded greatly during the past biennium. The largest collector may ship as many as 200 carloads annually to foreign countries and within the United States.

Members of this division make occasional inspections of plants, such as rhododendron and azaleas, while they are still growing in their native habitat on the mountain side. We are also called upon frequently tomake inspections of such native plants just before they are loaded in cars, and to certify them as free of insects and disease. Efforts are also made to restrict the movement of native plants in violation of the regulations of the department of agriculture.

Numerous permits ,covering individual small shipments of native plants have been issued during the past two years. Such a permit tag is sent upon request made to the department.

Insect Survey of North Carolina

A survey of the insects of this state was begun by the entomology division of the Department in 1902. As additional species are collected, or otherwise found or sent to the office for examination, they are listed and recorded. Specimens are always mounted and assembled in insect boxes in our state collection. Reference to this insect collection and index is made frequently for records of the

abundance and distribution, and the life habits of the kinds of insects that are brought to our attention in various ways. The records are frequently consulted by entomologists in other states.

A total of 8,234 species is now known to occur in North Carolina. We estimate that this is about one third the number of kinds that actually occur in the state. A total of 247 kinds of insects was added to the list in the recent biennium. Of the near insects (spiders, mites etc.) 127 kinds were added, making a grand total of 374 species of insects and closely related animals added to our state list during the past two years.

This list of insects should be made available for the study of interested persons including biology teachers of the state and entomologists of other states. It is hoped that the list may be issued in printed form in the near future.

Insect Complaints

From December 1928 to December 1929, a total of 210 different kinds of insects was either inquired about or complainte of as doing harm to man animals or crops. During the past year 194 different kinds of insects were the subject of letter inquiry. Information was sought by the public most commonly upon such insects as the Mexican Bean Beetle, the Mediterranean Fruit Fly, the Boll Weevil, Ants and army worms.

The letter complaints indicate that the Psocids and the Wooly Maple Aphis were unusually abundant on trees in 1929. House ants were unusually annoying in both the years of 1929 and 1930. The boll weevil severely damaged cotton in 1929, and threatened to do so in 1930 but was prevented from doing so by the hot and dry weather which slowed up its numerical increase. The Mexican bean beetle continues to be a severe pest of beans. This pest is now spread over the entire state. It is responding to control with the recent development of more effective poisons and more adequate dusting machinery.

Phony Peach Disease Eradication

With the finding of the Phony peach disease in other southern states it was thought advisable to make an inspection of commercial and home peach orchards in this state to ascertain whether or not the disease had reached North Carolina. The phony disease is spread largely through peach nursery stock, and much of our peach planting has been done with Georgia grown nursery stock.

An assistant of this division, in cooperation with two inspectors of the U. S. Bureau of Plant Industry, accordingly inspected 105 commercial orchards and 975 home orchards in 38 counties during 1930. Only three home orchards were found infected with the disease. Only ten trees were found diseased. All were found in Anson county. The trees have been cut down.

The inspection work thus far has necessarily been of a hasty nature. It is not improbable that additional phony infected trees would be found by a more thorough inspection. The preliminary inspection indicates however, that the disease is not widespread in North Carolina.

Since several southern states are conducting eradication programs in connection with this disease by cutting down all infected trees, it appears advisable that the Department of Agriculture should inspect the home and commercial orchards of this state thoroughly during 1931, to ascertain whether or not there are other phony infected trees in the state. Frequent inspections of our plant nurseries show complete freedom from the disease.

Narcissus Inspection and Treatment

The rapidly expanding bulb growing industry of the state has demanded not a little of the time of the division in the inspection of narcissus in the field, of the salable bulbs in storage and the supervision of the hot water treatment of all newly imported bulbs. Unless the spring and summer inspections of narcissus foliage and lifted bulbs are made, and their freedom from insects and nemote worm certified, the growers are unable to ship their bulbs interstate, being prohibited by a Federal quarantine.

There are now 23 commercial growers of bulbs including narcissus in North Carolina. Twelve of these properties were inspected in 1929 just after the blooming period. A total of approximately 178,030 bulbs were inspected for these growers after the digging season. Three of the properties were found infested with the lesser bulb fly, and the bulbs ordered fumigated before they were certified. One property was found infested with the larger bulb fly. No infestation of nematode worm was discovered.

In 1930, a total of 16 bulb growing establishments was inspected, once after the blooming period and again after the bulbs were lifted. The plantings of six growers were found infested with the lesser bulb fly, and four plantings of one grower were found infested with the larger bulb fly. No

narcissus nematodes were found. A total of 468,550 bulbs was inspected at digging time, - nearly three times as many as in 1929.

As mentioned above all newly imported narcissus are required to receive the hot water treatment under the supervision of an assistant of this division before they are released to the growers. This treatment is given at the warehouse of the North Carolina Bulb Growers Association at Wrightsboro. A total of 30,000 bulbs received this treatment during October 1929. Inspection showed that 0.33% of the imported bulbs were infested with the greater bulb fly. None was found infested with the lesser fly or the nematode worm.

In 1930, a total of 133,240 narcissus bulbs was imported and given the hot water treatment. Examination of the bulbs before treatment showed that 0.92% were infested with the greater bulb fly and 0.015% were found infested with the lesser fly. None was infested with the nematode. Examination of the bulbs after the hot water treatment has repeatedly shown that sterilization kills the maggot stage of both kinds of flies.

In connection with this report on narcissus certification and treatment it is of interest to note the growth of the bulb industry in eastern North Carolina. This is indicated by the further importation of narcissus bulbs each year as reported above, and by our office records showing that 319,900 and 474,000 bulbous iris were imported respectively during the seasons of 1929 and 1930.

Mediterranean Fruit Fly

Following the discovery of the Mediterranean Fruit fly in Florida in April 1929, considerable attention was given by members of this division to the inspection of Florida grown fruits and vegetables that were being shipped into this state. In cooperation with the Federal Plant Quarantine Control Administration, 19 temporary inspectors were appointed to examine fruit on the market, in storage and locally growing fruit, for specimens of the fly. Five regular inspectors of the Department were also temporarily assigned to this work.

Maggots of the fly were found in 60 crates of oranges held in a cold storage in Greensboro in May 1929. On June first four adult flies were found in a small grocery store at Raleigh. The infested fruit was condemned and destroyed.

In this inspection work, a total of 12,096 crates of oranges and 5,464 crates of grape fruit were examined.

There was a possibility that some of the adult flies had escaped from the Raleigh store, consequently the trees and shrubbery within a radius of five to seven blocks of the store were sprayed twice with a solution designed to poison the flies if they fed upon it. The store was also fumigated and all fruit in it burned. Subsequently all fruit was removed and destroyed from the trees in private backyards within a radius of three to four blocks of the store.

Repeated inspections of fruit and vegetables in the vicinity of the store where the flies were found have shown that the fly has not apparently become established. Bait traps were also placed in strategic positions in an effort to attract and capture adult flies. The results were negative.

As in other southern and western states where the climate was such as to be favorable to the development of the fruit fly, this state was rather intensively scouted for the fly or its maggot stage in home and commercial fruit orchards during the summer months of 1929. In this inspection work 7,925 premises in 71 counties were examined, of which 1243 were commercial and 6682 were residential properties. These properties included 591,039 fruit trees.

In this inspection work a total of 235 lots of specimens suspected as being fruit flies or their maggots were submitted to this Division by the inspectors for identification and hundreds more were brought or sent to the department by citizens of the state.

All of our inspection work indicates that the fruit fly has not become established in this state. It has apparently been eradicated from Florida. It appears advisable, however, to make further timely inspections of back yard orchards on the edges of our larger cities another summer.

Queen Breeders Inspection

The queen breeding apiaries of eight beekeepers have been inspected twice each year during 1929 and 1930 to ascertain whether the colonies are free of American and European foulbrood disease. No disease was found and these apiaries are therefore certified and permitted to make shipments of queen bees within or out of this state.

Bee Disease Eradication

The program of eradication of American and European foulbrood of bees in Buncombe county was continued during the past two years. The part time of one assistant is given to this work. In 1929 a total of 155 apiaries including 1275 colonies was inspected. Sixty one colonies were found diseased and destroyed or ordered destroyed by the inspectors. In 1930 the apiaries of 148 individuals including a total of 856 colonies were inspected. There were found 107 colonies infected with American foulbrood, and 26 infected with sacbrood. Of the foulbrood infected colonies, 28 were destroyed and 79 were treated.

The bee disease eradication work is in popular favor with the commercial honey producers.

Boxwood Leaf Miner

The presence of a destructive enemy of boxwood foliage known as the leaf miner was first established in the state during February 1930. Its discovery was made by a landscape architect in Greensboro. North Carolina has always been regarded as being free of this pest, and some effort was being made to prevent its introduction from other infested states. This insect mines (feeds) within the leaves of boxwood thus causing much of the foliage to drop prematurely. Boxwood bushes that are repeatedly infested become weakened and die.

An inspection of growing boxwood bushes was made in and around Greensboro. Five infested properties were found. The evidence indicated that the insect had been accidentally introduced on boxwoods that originated near Philadelphia, Pa. In one instance the insect had spread to the boxwoods on an adjacent property.

Brief studies of the life history of the miner were made so as to ascertain when the infested boxwoods should be treated in order to control and eradicate the insect. The owners were ordered to spray their infested boxwood at a stated time. The spraying treatments were given with very beneficial results. The same infested boxwood bushes are to be treated at the proper times in the future, in the hope of eradicating the insect upon the known infested bushes within the state.

Peach Insect Work

This division has continued to operate its field laboratory at Aberdeen in 1929 and 1930 during the peach growing season. Limited studies of the habits of the curculio and other peach insects were made at the laboratory and from these studies the commercial peach growers are advised how and when to treat their peach trees in order to control the pests.

The part time of one assistant is given to this work.

This information is given to the growers by letter and personal consultation. During 1929, such information was sent in 532 letters to 133 commercial peach growers. During 1930, a total of 665 letters was mailed to the same growers.

When economic conditions permit, the Curculio and other peach insects are controlled quite effectively by the growers. There are seasons when prices of fruit are such as not to justify the carrying out of all recommendations, and in such seasons the commercial control of insects in the peach orchards is not always satisfactory.

General Work

In addition to the above mentioned subjects the members of this division give much time to general field work when needed in connection with outbreaks of insects. Miscellaneous duties include the preparation of reports, general office duties and the giving of radio talks which numbered 27 during the past two years.

Acknowledgements

I wish to acknowledge your continued support and interest in our entomological work, and the faithful service of each member of this division.

Respectfully submitted,

R. W. Leiby,
State Entomologist.

Commissioner W. A. Graham
Office

Dear Commissioner Graham:

I am submitting herewith a brief report covering activities of this Division during the past two years and wish to call your attention to the expansion of the fruit and vegetable work and the new projects which we have started during this period.

Commodity	Carlot Inspections or equivalent	Approximate No. of Packages
Apples	35	5,800
Beans	493	288,700
Cabbage	70	28,000
Corn (Green)	26	11,844
Cucumbers	371	180,492
Dewberries	26	4,800
Hudkleberries	39	8,924
Peaches	1,014	445,588
Peas (English)	35	19,775
Peppers	1	310
Potatoes (Sweet)	305	95,800
Potatoes (White)	7,218	1,457,000
Squash	2	1,020
Strawberries	1,666	377,000
Tomatoes	91	54,600

The above represents inspections and certification as to grade and required a personnel of ninety to one hundred temporary men during the heavy movement in June.

Buying and selling of fruits and vegetables is done largely on the basis of U. S. No. 1. grade and the inspectors act in a neutral capacity in certifying as to grade which is of a benefit to the grower and shipper.

New Commodities inspected this year at various points are as follows: peas at Elizabeth City; cabbage at Beaufort; beans, peas, potatoes and various vegetables at Goldsboro; green corn, huckleberries, potatoes and various vegetables at Clinton; cucumbers at Southport; cucumbers at Clarkton; cucumbers, beans and potatoes at Tabor; cucumbers at Teachey; strawberries at Rose Hill; tomatoes at Laurinburg, John Station, Gibson and Rockingham.

In addition to the offices names above, we had temporary offices at Mount Olive, Bayboro, Columbia, Creswell, Aurora, Bethel, Pantego, Clarkton, Fairmont, Washington, New Bern, Longwood, Bolivia, Watha, Wallace, Chadbourn, Hamlet, Aberdeen, Marston, Ellerbe and Candor. From these offices we were in a position to take care of the inspectional work at the various points within a radius of twenty to twenty-five miles. For example, men located at Mount Olive inspected produce for growers and shippers at

Calypso, Faison, Warsaw and Bowden.

Members of this Division have assisted in more orderly marketing at the various shipping points and we spent quite a bit of time in helping develop and supervising the auction market at Clinton and at Goldsboro.

I wish to quote portions of a letter from one of the County Demonstration Agents, relative to the work which we are doing on fruits and vegetables, which reads as follows:

"I have been visiting the local Goldsboro and Mount Olive truck markets and observing the work being done by the inspectors under the supervision of your department. I wish to commend the several individuals who are doing this inspection grading work and, from my observation, I am certain that this is a really educational work and I am sure that it is being favorably received by farmers and buyers."

Terminal inspection on carlots of fruits and vegetables received in the various markets throughout the State are as follows:

Onions	White Potatoes	Grapes
Apples	Watermelons	

Inspections of this kind are of great value to the wholesale dealers in the State in order that they may show the shipper the actual quality and condition of the product, thereby, making a better adjustment.

STABILIZATION OF WHITE POTATO INDUSTRY.

The Interstate Early Potato Committee was organized some two years ago by the Extension Departments of North Carolina, Virginia and Maryland and the Bureau of Agricultural Economics and the Extension Department of the U. S. Department of Agriculture to help stabilize the white potato industry, following the disastrous year of 1928. Mr. A. E. Mercker is secretary of this Committee.

Prior to the formation of this Committee, we had set up in this State the North Carolina Produce Growers Cooperative Association, which is composed of growers and shippers of white potatoes constituting approximately 80 to 85 per cent of the white potato tonnage grown in North Carolina. The writer has acted as secretary to this organization during the past two years and the primary purpose of the organization is to help stabilize the potato industry, and we have worked very closely with the Interstate Early Potato Committee.

At the beginning of the potato season during the latter part of May, I wrote to members of our organization advising that various State and Federal Institutions were spending approximately $10,000 to assist them in stabilizing their industry and asked that they give Mr. Mercker their greatest support and cooperation in this project. Phillips and Company replying to my letter wrote as follows:

"We acknowledge receipt of your letter of the 5th to members of the above association and note that the Department is spending $10,000.00 per year on the work of stabilizing the market on potatoes in North Carolina.

"I believe this money is well spent. In fact, I am almost sure that this has saved the shippers of North Carolina this year $200,000.00, or at least $100.00 per car on something like 2,000 cars of potatoes that have moved out of the State in the past two weeks. Without Mr. Mercker's assistance and your cooperation, we feel sure that the market would have been $3.50 per barrel, probably $3.00 f.o.b."

With reference to the above, permit me to advise that potatoes were being quoted f.o.b. $4.50 to $4.85 the date which this letter was written and you can readily see the savings that were made by this stabilization.

MARKET NEWS.

We issued daily bulletins on strawberries from Chadbourn, white potatoes from Elizabeth City, and peaches from Dandor during the shipping season. These bulletins give the shippers pertinent information on such as F. O. B. prices at the larger shipping points, number of cars shipped each day, and the number of cars each of the terminal markets receives, along with the price each market is paying. This information helps materially the grower and shipper in better distribution and marketing.

FARM CROPS

Assistance is given in the standardization and marketing of any and all farm crops.

TOBACCO

The grading work on tobacco was started at Smithfield in September of 1929, and proved very popular with tobacco farmers, buyers and warehousemen. There was a fine spirit of cooperation between all interested parties and everybody spoke highly of the services which we have rendered. There is a small fee charged for this work and this project will in all probability approach the self supporting stage when the work is fully organized. We graded in 1929 1,552,060 pounds of tobacco, and the market news service report covering this project shows that the growers who had their tobacco graded received from 88 cents to $6.46, averaging approximately $3.48 per hundred more than the growers who failed to take advantage of this service.

This work was expanded in 1930 ~~in 1930~~, and in addition to operating at Smithfield, we are carrying on grading work at Washington, Williamston, Tarboro, Wendell, Fuquay Springs and Henderson. Through October 31st, of this year we have graded 2,097,594 lbs. of tobacco, and it is thought that we will grade somewhere around four or five million pounds for this year. It is very likely that this work will be expanded next year and that it will be only a matter of a few years before we will be covering all of the

markets in the State.

PEANUTS.

Heretofore peanuts have been sold as peanuts and very little attention has been paid to the quality and condition of any given lot. We have established grading services on the commodity at Edenton and Williamston, and now the growers can sell on the basis of grades and grade requirements. Many in close contact with the peanut situation frankly state that the time is rapidly approaching when peanuts will be bought and sold strictly on the basis of grades. Should the service prove popular, we will expand it to other producing points next year.

During the 1929 season we inspected and certified as to grade 6,300 bags of peanuts. At this writing the picking for this season has not been completed, but it looks now as if we will get to do quite a bit of work throughout the entire peanut belt. In order to cover the entire territory, it appears as if it will be necessary for us to license from one to three men in each county to draw samples of the peanuts at the time they are bagged and these samples will be sent to our main offices at Williamston and at Edenton, where the certification as to grade will be determined.

SOYBEANS.

Certification as to grade on soybeans was continued at Elizabeth City and Washington and we inspected and certified as to grade 115,894 bushels.

POULTRY.

Cooperative live poultry sales are no longer in the experimental stage. However, they are successful to the extent of good management and the effect of business conditions in general. For these reasons the cooperative poultry shipments for the last two years have been highly successful and as a whole satisfactory.

Prices on live poultry quoted at eastern market terminals during 1930 range from 5 to 12 cents per pound below the prices of 1929, with the larger difference predominating through the seasons.

For the year 1929 and the first six months shipping period of 1930 there were shipped from this State to northern markets 10,259,811 pounds of live poultry valued at $2,448,000.00. The fall shipping season for 1930 has not yet begun at the time of this writing but mixed shipments of chickens and turkeys is expected to be between 75,000 and 100,000 pounds. This total of 10,259,811 pounds (not including fall 1930 expectations, gives a two year average of 5,129,905 pounds, which average is greater than any one year's total prior to 1929.

1923-1928	(Inclusive) total shipments	9,872,053
1929-1930	(not including fall 1930) shipment	10,259,811
1923-1928	Six year average	1,645,342
1929-1930	two year average	5,129,905

As has been pointed out in previous reports, this movement of carlot poultry shipments is a prize stabilizer. It not only moves out the surplus and makes local prices better (by 2 to 5 cents per pound), but it stimulates production; more poultry to sell and more poultry and eggs on the daily diet of the farm family.

This work has been far reaching, having served the farmers in practically 90% of the counties in the State. During this two-year period more than 175,000 farmers have patronized these sales.

Following are the dealers cooperating:

F. B. Price	Salisbury, N. C.
E. E. Eller	N. Wilkesboro, N. C.
Mt. Airy Produce Exchange	Mt. Airy, N. C.
Farmers Federation	Asheville, N. C.
G. S. Miles	Greensboro, N. C.
Risser & Rabinowitz	Goldsboro, N. C.
Eagle Poultry Co.	Shelby, N. C.

EGGS.

Our most successful work with eggs has been done through storage. North Carolina towns and cities will take all our production except during the spring months. In fact during the fall and winter production is below consumption. In the spring months when there is necessity for shipping out and removing the surplus eggs, weather conditions are such that "general run" of country eggs are in poor condition and we are unable to interest buyers. Cold storage seemed the only solution to the problem and this work was started in a small way during the spring of 1928.

During 1929 and 1930 this office, through the county organizations cooperating, stored as follows:

1929	372	cases of 30 dozen each
1930	2225	cases of 30 dozen each
Total	2597	cases of 30 dozen each

Average prices of 1928 storing sold in 1929	32¢ net
Average prices of 1929 storing sold in 1930	34¢ net

This net price is over and above the cost of handling, processing and shipping. The eggs stored in 1930 have not as yet been sold. Indications are these will bring a net price slightly lower than the previous sales.

There is a feature of the work which must not be overlooked, and that is the educational work done among the producers. Every farmers' eggs were candled, graded and packed in his presence. He was taught that eggs are not always eggs and that clean, well graded, well packed product is worth more to him and to the consumer. This work is increasing each year and more and more farmers are using this method of disposing of their surplus eggs. Educa-

tional work and demonstrations are a continual part of the program of this office.

WOOL.

Wool collected mainly from the western counties was gathered in county pools and in accordance with the desires of the local wool pools, after representatives of this office had explained thoroughly the market conditions. Part of the clip was delivered to the United Wool Growers Association, through the cooperation of the Federal Farm Board, and some was sold on bids received from dealers and manufacturers in this State and Virginia.

On the cooperative sales 396 farmers in ten counties delivered 37,961 pounds of wool, on which the Farm Board advanced twenty cents clear wool, sixteen cents burry wool, and thirteen cents hard burry wool, or $7,781.76. Following is a tabulated statement:

Date	County	Place	No. Farmers Delivering Wool	No. Lbs. Wool Delivered	Amount Advanced
May 23-24	Madison	Marshall	51	4,124	$ 804.34
" 26	Buncombe	Asheville	40	3,748	742.00
" 27	Henderson	Hendersonville	4	498	98.47
" 28	Macon	Franklin	32	1,945	364.35
" 29	Jackson	Sylva	39	2,487	480.12
" 30	Haywood	Waynesville	109	12,773	2,531.52
" 31	Yancey	Burnsville	16	1,166	239.33
June 2	Avery	Newland	90	9,262	2,109.23
" 13	Granville	Oxford	6	605	121.00
	Currituck	Moyock	11	1,325	270.40
		Total	396	37,961	7,781.76

On the outright sales four counties delivered 107,000 pounds for a total value of $28,095.00, or an average price of 26¢ cents per pound. Following is a tabulated statement:

Date	County	Place	Price per lb.	No. pounds wool sold	Amount
June 2	Ashe	West Jefferson	25¼¢	50,000	$ 12,625.00
June 4-5	Alleghany	Sparta	27¢	25,000	6,750.00
June 4-5	Wautaga Avery	Boone Banner Elk	27½¢	32,000	8,720.00
		Total		107,000	$ 28,095.00

LAMB SHIPMENTS.

Following are some of the results of our renewed activity in the western part of the State:

81 Carloads of lambs shipped cooperatively containing approximately 10,000 lambs in shipments.

$15,000 more was received by shipping cooperatively than if sold locally.

$1.00 per head was extent of boosting local buyers' price on 80,000 lambs in addition to the cooperative shipments made.

BEEF CATTLE SHIPMENTS.

216 carloads cattle shipped containing approximately 7,000 head cattle shipped as result of drought of 1930 1/2¢ more per pound was received from these shipments than the shipments made in East Tennessee, or $3.50 per head more than growers in East Tennessee received.

9,000 head cattle held at the time of this writing for the higher market next spring.

40 head of scrub bulls were sold for slaughter. These bulls were replaced by purebred dairy animals.

53 head of purebred Guernsey and Jersey bulls were placed with producers. In this work this office assisted.

HOGS.

This office assisted in selling four cars of hogs during the earlier months of 1930. Two cars of hogs from Halifax County brought 10¾ cents per pound. Two cars from Bladen County brought 10½ cents per pound. Hog shipments are now being made by truck rather than by rail. Truck drivers collect the hogs independently of county agents and agricultural teachers. Due to this movement a great deal of cooperation in this work has about stopped, at least temporarily. Another factor affecting cooperative marketing of hogs is the selling of young pigs for barbecue locally.

In the livestock and poultry marketing projects, we have had the cooperation of the Extension Service and the Department of Vocational Education.

ORGANIZATIONS.

The value of some kind of county organization through which marketing activities may be conducted cannot be emphasized too much. The nature of these organizations and their activities have been included in reports prior to this. Representatives of this Division have been actively engaged in several counties promoting the mutual exchange idea. Seven were added to the list this spring. There are now a total of:

31 Mutual Exchanges
37 Poultry Associations
6 County Livestock Associations and Boards of Agriculture.

Poultry associations were organized for the purpose of increasing interest in production and assisting members in locating markets for their produce.

However, marketing problems in other commodities have arisen. Mutual Exchanges are to be organized so that they may be able to market all commodities grown in a county except cotton and tobacco. Since it is cumbersome and impractical to have a commodity marketing organization for each commodity grown in a county,

mutual exchanges are being organized to take care of marketing phases of all commodities.

The following mutual exchanges have been organized during the past two years.

Cumberland Mutual Exchange	Fayetteville
Smoky Mountain Mutual Exchange	Sylva
Hamburg Truckers Mutual Exchange	Jackson County
Jackson County Mutual Exchange	Sylva
Wake County Mutual Exchange	Raleigh
Johnston County Mutual Exchange	Smithfield
Stanly County Mutual Exchange	Albemarle
Carteret County Mutual Exchange	Beaufort
Granville County Mutual Exchange	Oxford
Sampson Farmers Mutual Exchange	Clinton
Scotland Neck Mutual Exchange	Scotland Neck
Currituck Mutual Exchange	Moyock
Durham Farmers Mutual Exchange	Durham
Wayne County Farmers Mutual Exchange	Goldsboro
Rose Hill Mutual Exchange	Rose Hill
Mt. Olive Mutual Produce Exchange	Mt. Olive
Alleghany Farmers Mutual Exchange	Sparta
Zebulon Mutual Hatchery & Poultry Asso.	Zebulon
Cary Mutual Poultry Association	Cary
Lenoir County Mutual Exchange	Kinston
Jones Mutual Exchange	Trenton
Fuquay Mutual Poultry Association	Fuquay Springs
Anson County Mutual Exchange	Wadesboro
Seaboard Farmers Mutual Exchange	Monroe
Southeastern Poultry Farmers Exc.	Wilmington

I might add also that we are working very closely with these organizations and have advised from time to time relative relative to their operations and have set up standard system of bookkeeping in each of them.

Respectfully submitted

R. B. ETHERIDGE, CHIEF
DIVISION OF MARKETS

SAVINGS AND LOAN ASSOCIATIONS
November 1, 1930

Harriet M. Berry, Superintendent.

- - - - - -

Hon. W. A. Graham, Commissioner
North Carolina Department of Agriculture
Raleigh, North Carolina

Sir:

Since the last biennium, the work of the Savings and Loan Associations has grown steadily in number of organizations and growth of the individual associations. There are now in the State fifty-five active associations in twenty-eight counties, extending from Wilmington to the Tennessee line. The resources of these associations are increasing in spite of the general financial distress and practically every one has paid a dividend at the close of their fiscal years. Their total resources now amount to $276,513 with 2,153 stockholders, 1,341 borrowers and 897 depositors. This represents money saved by farmers and wage earners, practically none of whom had engaged in any appreciable saving previous to the set up of their associations.

In recent months many inquiries have come in regarding the organization of additional associations in various sections of the State, principally among farm groups. The majority of these, however, desire to have associations which can secure for them production and marketing credits through the Federal Intermediate Credits Bank and the Federal Farm Board.

Because of this demand, the Superintendent of Savings and Loan Associations has had interviews recently with President Legge of the Federal Farm Board in Washington and President Daniels of the Federal Intermediate Credits Bank at Columbia, S.C. It was found that such a line of production and marketing credits can be secured for North Carolina farmers through the organization of an Agricultural Credit Corporation, which could rediscount farm paper through the Federal Intermediate Credits Bank, or the organization of a Federal Farm Bank which could rediscount directly through the United States Treasury or Federal Reserve Bank. In the latter case, there would be a saving of one per cent for rediscounting privileges over such an accommodation thru the Intermediate Credit Bank, which would enhance the earning power of the proposed bank.

With the local or community savings and loan associations established throughout the agricultural areas to act as credit agencies for distributing, collecting and supervising the expenditure of these loans (production and marketing) a system of farm credits could be gradually worked out which would not only relieve the farmer in this financial crisis, but would enable him to pay cash for supplies, which, in turn, would help the local merchants, banks, etc. Also, through such a plan the farmer's

credit could be obtained at from ten to thirty per cent cheaper than the outworn system of time purchase now in vogue. It is believed that the Department of Agriculture could render a very great service to the farming industry of North Carolina by fostering such a plan for establishing credits.

Respectfully submitted

HARRIET M. BERRY, SUPERINTENDENT
Savings & Loan Associations

STATE WAREHOUSE DEPARTMENT

To the Commissioner of Agriculture,

Sir:

The following report covers the activities of the State Warehouse System for the years 1929, 1930.

There were licensed in the State during the year 1929 forty-six warehouses. These warehouse took care of 156,000 bales of cotton. During 1930 fifty-two warehouses were licensed, in which were stored over 200,000 bales,or approximately thirty per cent of the North Carolina crop. The warehouses were inspected four times a year by Federal inspectors, and no serious infraction or irregularity was found.

The services of a Federal licensed classer were obtained to class cotton for any of the depositors who desired their cotton classed.

Mortgages held by the State were foreclosed in the following cases: Benson Cotton Warehouse,Benson,N.C., Lillington Cotton Warehouse,Lillington,N.C., and the Warren County Cotton Warehouse, Norlina,N.C. There was due the State from these warehouses $16,050. All of the warehouses were bid in by the State. One warehouse - namely, the Farmers Cotton Warehouse at Moncure,N.C., has been charged off the books, due to the fact that accrued taxes are now more than the value of the property.

Cotton storage warehouses had three bad years in succession, but last year was a good one, and the present year promises to be even better; consequently, most of the warehouses owing the State should be able to meet their payments promptly.

Below is a statement of the funds of the Warehouse System.

Actual or estimated as of June 30 each year.	Cash on hand in Principal Fund.	Amt.of outstanding loans on warehouses on which State holds first mortgages.	Invested in State Institutional and Government Bonds.	Cash on hand in Supervision or Operative Fund	Transfers from Supervision Fund to Principal Fund
1929	$ 5,743.48	$301,142.50	$300,000.00	$ 6,626.53	None
1930	16,000.00	293,742.50	303,000.00	10,320.64	$8,029.02

Respectfully submitted,

A. B. FAIRLEY
State Warehouse Superintendent.

Raleigh, N.C.,
November 7, 1930.

Hon Wm. A. Graham, Commissioner
North Carolina Department of Agriculture
Raleigh, North Carolina

Dear Mr. Graham:

The following report covers the activities of the Dairy Division of the North Carolina Department of Agriculture for the year 1930. The Dairy Division being created January 1930 has only a short period to render its report for:

A statement regarding the Dairy Industry, its production and value show the problems that the Division has to deal with.

An estimate based on cheese factories show that they handle production valued at $250,000.00 and that of this amount 1,500 dairy farmers receive $120,000.00. Farm creamery butter manufactured in North Carolina reaches the value of approximately $6,000,000. for which 12,000 farmers receive approximately $4,000,000.00.

It is stated that the United States consumes 17 pounds of butter per capita each year. Upon this basis North Carolina should use 53,800,000 pounds of butter which would show us short in production more than 50,000,000 pounds. It is easily seen therefore, that the 288,680 cows is far below what we should have to maintain ourselves and "Live-at-Home". It is estimated further that whole milk produced by 1,000 farmers valued at $15,000,000 was distributed and delivered in our towns and cities. The most distressing need for dairy production and dairy development is clearly seen in the family cow. This Division hopes to see the day when North Carolina can boast of 1,000,000 dairy cows.

Visits have been made as follows: Cheese plant inspection 20; butter fat tests made 2,060; creamery inspection 49; cream station inspection 32; milk plant inspection 40; producers visited and assisted 250; ice cream plant inspection 56; cream route inspection 30. The Dairy Division has participated in 65 meetings of dairy farmers, the attendance being 2,500 people. The Chief of the Dairy Division has made four public addresses to civic organizations and two radio addresses over WPTF. He has also visited and discussed dairying at ten fairs. One hundred and twenty-five farmers have been explained the methods of testing cows and dairy products. The Chief of the Dairy Division has also visited the Test Farms and attended the field days at the Mountain Station and the Coastal Plain Station. Also attended the Jersey meeting and the Guernsey meeting and two other cattle sales and meetings.

The Dairy Division also participated in the livestock train operated by the Atlantic Coast Line Railroad in cooperation with the North Carolina Department of Agriculture.

Special emphasis is hereby expressed by the Chief of the Dairy Division for the hearty cooperation of all branches of the North Carolina Department of Agriculture and other State Departments. I also wish to express our appreciation for the cooperation of the county agents, vocational teachers and school superintendents throughout the State.

Respectfully submitted

A. H. KERR, CHIEF
DAIRY DIVISION

BIENNIAL REPORT
OF THE
CURATOR OF THE MUSEUM
For the Biennium Ending June 30, 1930

Hon.William A. Graham,
Commissioner of Agriculture,
Raleigh, N.C.

I beg to submit herewith my report on the operation of the State Museum Division of the Department of Agriculture for the two years ending June 30,1930.

Office Work: This has been carried out as well as possible under the unfortunate conditions prevailing. But so long as Mr.Davis and I have to do our own letter writing, filing, cataloging and other work of the office that could be so much better performed by a trained office worker, it can never be satisfactory - at least, to us. Furthermore, an office assistant, with some training in biology and other sciences, could act as information clerk and so relieve us of the time necessary in answering the great number of enquiries we receive on more or less simple matters. As it is, office work and answering enquiries take up much of the time that we should apply to technical matters, in which we are always far behind.

Geological: The determination of geological specimens forms a material part of the work of my associate, Mr. Harry T.Davis, many of these determinations calling for a chemical analysis. The preparation of such specimens for exhibit purposes, the classification and display of all the Museum's Geological exhibit and the cataloging and labelling of most of the material in the Museum, are all on his shoulders. He has also taken several prospecting trips after geological specimens, with good results in all cases. Conjointly, we have made two trips after fossil specimens, one of them resulting in the securing of some mastodon remains and the other in the acquisition of some bones of a fossil whale. Mr. Davis is also active in all other phases of the work of the Museum.

Zoological: All enquiries relating to the various branches of zoology - with the exception of those of an entomological character - are handled by me, and the preparation of specimens, repair work on specimens, the arrangement and display of the completed objects in their cases, are in my hands. Some of the more noticeable items of these lines of work that have been carried out during the biennium are noted under the sub-heads of Accessions and Additions to Exhibits.

Accessions: A collection of mastodon remains from New Hanover County,donated by Saml.T.Burrus, Inspector of the dredge, "Norfolk"; bones of fossil whale, from Wayne County, donated by A.A. Aycock, Fremont,N.C.; bone of a prehistoric horse from Wrightsville Beach, donated by E.E.Foster, Fort Lauderdale,Florida; fossil shark's teeth, from Beaufort County, donated by J.H.Pinkham, Washington,N.C.; skull of large loggerhead turtle from the Roanoke River, donated by Miss Lena H. Smith, Scotland Neck; a number of old farming implements and appliances donated by J.C.Pass, Roxboro,N.C.; a large specimen of petrified wood; stone meteorite from Ashe County; an old hand-loom from Lee County; an iron meteorite weighing 161 lbs. from Randolph County; the skin of a 16 foot Thresher Shark,donated by J.B.Fayles' Sons, Wilmington,N.C.; a 55 lb. Nurse Shark in the flesh, donated by Frank Bennett, Durham, N.C.; a pearl from a common clam secured by the writer; chicken turtle from Onslow County secured by Mr.Davis; soft-shelled turtle from Anson County donated by U.B.Blalock; a Sooty Shearwater, donated by Dr. Jas.S.Gutsell, U.S.Biological Laboratory, Beaufort,N.C.; 15 pieces of pottery from Guilford County, donated by the Log Cabin Potteries. The large meteorite is one of the Museum's most

valued possessions, and several of the other objects mentioned are very rare and new to the Museum collections.

Additions to Exhibits: The following noticeable additions have been made to the exhibits: Skeletons of a 55 foot Sperm Whale and a 47 foot Finback Whale; a case containing two Raccoons of a peculiar yellow coloration; a case with a pair of albino opossums; foot-bone of a prehistoric horse; case of mastodon leg-bones arranged as in life; case of implements such as harpoons, lances, bomb-gun etc. showing the equipment of a whale-boat; case of old farm implements and home appliances; case of Mexican Big-boll cotton; two new cases for gem material; a number of new live snakes; models of a sharp-nosed shark and two rays.

With only two technical workers in the Museum, and with much of our time occupied with work that is non-technical in character, it is not infrequent for specimens received in an unfinished condition to remain uncompleted for months and sometimes for several years before the opportunity arises for preparing them for exhibition. One 16 foot Thresher Shark is a case in point, the skin of this specimen having been in the pickling tank since the fall of 1928.

Working Library: In addition to purchases of books, we receive numerous scientific publications from the U.S.National Museum, the Field Museum of Nat'l . History, Chicago; the Carnegie Museum, Pittsburgh; the Museum of the University of California, San Francisco; the Buffalo Museum of Science, the Cleveland Museum of Nat'l.History, the Illinois State Museum, Springfield; the Louisiana State Museum, New Orleans, and a number of others. Also, the Museum subscribes to several scientific periodicals, and we now have a great number of the above classes of scientific records that are greatly in need of classification and proper filing so as to be available without undue time being devoted to the finding of any particular article.

As our Museum has no publications of its own for exchange we have endeavored to reciprocate in part by supplying a number of the Museums of the country with sets of photograph of our Sperm Whale.

Exhibit Cases: By employing at times a competent carpenter, and purchasing the material direct, we have been enabled to have a number of new exhibit cases built at figures below what they would have cost us if made by outside parties, or purchased from catalogues. The carpenter has also remodelled a number of old cases to make them as nearly dust-tight and insect-tight as possible, these features being a necessity if the contents of the cases are to be properly preserved. A number of trays for the storage of geological specimens have also been made on the same plan, as well as stands for mounted specimens and other items relating to the installations of exhibit-case interiors.

Lighting of Exhibit Halls: During the two years under discussion we have installed lighting fixtures in four of the exhibit halls, carrying on the work at the rate of two halls per year, as provided for in our appropriations. It is our intention to extend this necessary feature to two more halls during the current fiscal year, for which the funds have been provided, and we hope to be able to complete this improvement in the first year of the next biennium.

Attendance at Technical Meetings: Both Mr. Davis and I attended the annual meetings of the American Association of Museums - to which we both belong - at Philadelphia in 1929 and at Buffalo in 1930, and I feel strongly that this practice should be continued. These meetings constitute the only direct touch with the workers in the other museums that is available to us, and I am quite sure that the benefits we derive therefrom, and afterwards used in the conduct of our museum, are worth far more to our institution than the costs involved.

At the Philadelphia meeting, a "Technical Section" of the Association came into being, and it has since been functioning with much success. It was my good fortune to be appointed a member of the Advisory Board of this Section, and as its Secretary. At the Buffalo meeting I presented a paper on the securing, preparing and mounting of the skeletons of the Sperm and Finback Whales that we completed last spring, which paper will be published - with illustrations - in a forthcoming issue of the Museum News, the official organ of the American Association of Museums.

Visitors to the Museum: The attendance of visitors to the Museum is computed by calendar years. While our attendance in 1929 showed an increase over previous years, the percentage of increase was lower than our expectations, which was no doubt due in part to the prevailing business depression. The figures for the first ten months in 1930 show a much greater percentage in gain than 1929 did over 1928, the total for the ten months very nearly reaching that for the whole of 1929. There is now little doubt that our figures for the current calendar year will pass the 200,000 mark for the first time in the history of the Museum.

Approximately 400 school classes per annum are included in the above figures, and these classes come from all over the State.

In figures compiled last year by the Secretary of the American Association of Museums, showing the number of visitors to each museum as compared with the official population of the city in which it is situated, the State Museum of North Carolina took second place, the State Museum of Missouri standing at the head. And it should be emphasized that attendance figures are the principal indication of the appeal a museum has to the public and the favor in which it is held.

In low cost of operation per visitor I do not believe that any museum in the country can even approach our figures. Our budget for salaries and maintenance and improvement totals $10,440. In addition to this, I estimate the cost of heat, light, water and minor repairs at not exceeding $2,500, making the total cost of pperation $12,940. On an annual attendance of 200,000 visitors, an operating cost of less than six and a half cents per visitor is indicated. Other museums for which comparative figures are available show costs of from 25 cents to 60 cents per visitor. But there is such a condition as keeping this cost too low.

Public Addresses etc.: Mr. Davis and I have both made addresses on matters connected with our work over the radio, to various civic clubs and to school classes during the period under discussion.

General: Collections of duplicate material - mostly geological in character - have been donated to the museums of several High Schools of the State.

State Fair Exhibit: As in former years, the work of preparing the installation for the Department of Agriculture exhibit at the State Fair has been mainly in our hands. Together with Mr. F.E.Miller, the museum force has exercised a general supervision of the preparations and installation of the exhibit, the assignment of space to the various Divisions of the Department, the harmonizing of differences, and considerable amount of attendance at the exhibit during the actual period of the Fair. This requires a large percentage of our time for more than a week immediately preceding the Fair as well as during Fair Week itself. The expenditure of the funds appropriated on this account is also in our hands. The Department's exhibit this year received much commendation, and my personal opinion is that it was the best exhibit ever made by the Department.

In closing, I desire to express to you my appreciation of your sympathy with our work in the Museum and the helpful attitude always assumed by you in the furtherance of our endeavors.

Respectfully submitted,

Raleigh,N.C. H. H. Brimley

November 1, 1930. Curator, N.C. State Museum

Addendum: The total number of accessions of all kinds during two years has approximated four hundred items.

If a small number of illustrations of objects in the Museum could be used in connection with this report, we shall be glad to supply the necessary photographs.

H. H. Brimley.

BIENNIAL REPORT OF THE DIVISION OF PUBLICATIONS, NORTH CAROLINA

STATE DEPARTMENT OF AGRICULTURE.

Hon. William A. Graham
Commissioner of Agriculture
Raleigh, N. C.

Sir:

Herewith is submitted the report of the Division of Publications, State Department of Agriculture, for the past biennial period, pursuant with the Laws of the State and your request for same.

This Division has functioned without interruption and without the necessity for added help, even though the work has undergone gradual and steady expansion. There has been no attempt to make any spectacular departures involving additional outlay or expense. However, this Division has, whenever called upon, given its full and voluntary cooperation in all matters pertaining to the agricultural welfare of the State, working at times in unison with other agencies designed to bring about better and more satisfactory conditions. This was especially true during the spring of 1930, when the editor, at the direction of the Commissioner, sat with a committee whose duty it was to devise ways and means for promoting the "Live-at-Home" campaign sponsored by the Governor and given the support of several State agencies, including the Department of Agriculture. In addition to this, the editor of publications stressed the importance of this movement in various ways, notably through the columns of Agricultural Review, a semi-monthly publication of the Department.

The duties of this Division are briefly outlined below, and this outline embraces not only the original duties of the Division but those that have been assumed and taken on with a view to making it more helpful to the people of the State, with special reference to the farming population:

a. To supervise all printed matter pertaining to agriculture and to see that this matter is properly distributed.

b. To issue and cause to be circulated on the 15th and 25th, of each month the official organ known as Agricultural Review, which has a circulation of approximately 6,000, most of the copies going to those engaged in the actual task of farming.

c. To see that the newspapers, through the various news agencies and correspondents, as well as local representatives, are supplied with any and all information regarding the Department and its activities in behalf of the farmers of the State.

d. To supply information to those who, numbering hundreds each month, desire not only agricultural publications but information on various agricultural subjects. If this information is not available inside the Department, it is generally secured from some other source and made available to applicants.

c. To see that the newspapers, through the various news agencies and correspondents, as well as local representatives, are supplied with any and all information regarding the Department and its activities in behalf of the farmers of the State.

d. To supply information to those who, numbering hundreds each month, desire not only agricultural publications but information on various agricultural subjects. If this information is not available inside the Department, it is generally secured from some other source and made available to applicants.

e. To provide for the presence of a speaker each Monday afternoon, to address a radio audience on some phase of the Department's activities.

These, briefly stated, are the outstanding duties of the Division of Publication. However, the foregoing paragraphs could be very materially expanded for the purpose of giving further and more detailed information on the work during the past biennium.

In connection with the report on the radio broadcasts, it might be stated that the editor of publications, with the approval and at the direction of the Commissioner, helped to arrange for the securing of daily market reports from Washington, free of cost to the Department, which are broadcast from the radio station at Raleigh. This work was launched early in the spring of 1930, at the request of growers and others interested in crop movements and prices.

Further, it is deemed advisable to mention in this report that the Division of Publications has cooperated with schools throughout the State in placing information at the disposal of students. This is regarded as a very important piece of work, due to the lack of information on North Carolina and its various activities in text books available to students. It would seem, at times, that about the only way these children have of finding out the real facts about how the State in which they live is operated is to write the Department in which they are interested for first-hand information. The Division of Publications has realized this and has endeavored to serve the school children of North Carolina, whenever possible, by providing them with material on which to base special studies, projects, etc., concerning agriculture. This has been done without added expense, as the Editor has worked with material already available or that which could be easily whipped into shape for school purposes. The files of this Division will show letters from thousands of school children asking for information that was always supplied whenever possible.

In the publication of agricultural news, the Division has found the newspapers of the State to be extremely cooperative, without exception. While it has been impossible at all times to arrange publication schedules agreeable to morning and afternoon papers alike, an earnest effort has been made to effect an equitable distribution of news matter.

There have been times and seasons when it seemed that additional help was inevtiable, in order to carry on the work of this Division. But this added expense has so far been avoided and the Division has managed to tide over such periods.

To you, of course, and to any others interested in the workings of the Division of Publications, the office and the files are always open.

With assurance of my deep and abiding interest in North Carolina and in the Department of Agriculture in all its efforts to bring about improved conditions, I am

Respectfully

WILLIAM H. RICHARDSON
Editor of Publications.

REPORT OF DIVISION OF FOOD AND OIL INSPECTION

TWO YEARS 1929 and 1930

Commissioner of Agriculture

Dear Sir:

I beg to submit the following report of the work of the Division of Food and Oil Inspection for the two years 1929 and 1930.

The work is authorized by and carried out under the following inspection laws: Pure food, bleached flour, standard weight meal and flour, sanitary bottling plant, bakery, creamery, ice cream plant and cheese factory, linseed oil, illuminating oil and gasoline.

The object or purpose of the work of the division is to protect the health, life and financial interest of the people of the State in the purchase of foods, beverages and other products covered by the above named inspection laws.

The food law forbids the manufacture or sale of adulterated or misbranded food or beverage. It makes it the duty of this Department to enforce same without providing any funds for the purpose, but the laws supplementing the food law do carry inspection taxes and the enforcement of the food law depends upon the supplementary laws as the expenses of all of the inspection, chemical and other necessary work, are borne by the use of funds from inspection taxes provided by the inspection laws. The laws supplementing the food law prohibit the food plants named in same being operated under insanitary conditions which would render food products put out by them being deleterious to health.

The sanitary inspection of food producing plants is done by the same men that do the general food inspection work which makes the cost of same as little as possible.

The inspectors make careful sanitary inspections of the food producing plants, inspect the food products put out by same and, when advisable, secure samples of the food for chemical examination for adulteration. They also see that food products are properly branded and labeled.

Since these inspection laws have been in effect, great improvements have been made in the sanitary and other conditions under which these plants are operated. While a large part of them are so conducted that they practically meet the requirements there are right many of them that must have regular and frequent attention or the products put out by them will be a menance to the health of the people.

As the Federal food inspection work to a large extent covers food products in interstate shipments and as the funds and force of the food and oil division are not sufficient to do all that should be done, the greatest effort of the division is given to food products originating in the State or to products shipped

into the State in bulk properly labeled and repacked or retailed brom bulk in the State but not then subject to the Federal laws.

Food and food products of various kinds obtained from various places over the State have been analyzed, chemically or otherwise, special attention being given to such products as butter, cream, ice cream, honey, oysters, bleached flour, sausage, carbonated bottled beverages, molasses and syrups, ground coffee, and various flavoring extracts shipped into the State in bulk, properly labeled when shipped in, but repacked or retailed from bulk without the facts in regard to composition being made known to purchasers. Some adulteration and misbranding have been found and the results have either been or are being reported to the courts for prosecution.

In some cases minor violations are such that reporting same to court for prosecution are not justified or necessary for obtaining best results.

LINSEED OIL.

The linseed oil inspection law requires that all linseed oil and substitutes for linseed oil offered for sale in the State be labeled what they are.

Examinations made of these products show that the law is being reasonable well complied with and that there is very little adulterated or misbranded linseed oil or substitutes for same sold in the State.

ILLUMINATING OIL AND GASOLINE.

Extensive examinations have been made of these products and comparratively little trouble has been had with them. The oil companies have practically met the requirements and the only real troubles have been due to accidentally mixing the two, and these cases have been due either to the careless action of lower employees or to retail dealers after the products have been delivered to them.

The oil companies continue to develop and improve the chemical methods of converting the heavier oils of the crude petroleum into high grade gasoline, which tremendously increases the volume of gasoline products.

MISCELLANEOUS.

The Department is often called upon to do much difficult chemical work not provided for by law and which is foreign to the provisions of the inspection laws under which the chemical work is done. When there appears to be reasonable cause for such work, and when it appears that it will serve a reasonable purpose, as there is no provision of law for such work as mineral water analysis, determining the alcohol in beverages, examining various substances such as foods, medicines, human and animal viscera, etc. for poison when crime is suspected, and drugs for cocaine, opiates, etc. for officials enforcing the laws, it is done by the food and oil division to aid in preventing crime and enforcing the criminal laws.

The food and oil division is also often called upon for the analysis of lubricating oils for motor purposes, and a considerable number of these oils are analyzed along with other oils and gasoline.

Many people in the State think that the sale of lubricating oils ought to be regulated by an inspection law.

- - - - - - - - - - - - - - - - - -

Regular inspections, sanitary and otherwise, have been made of the following plants and excellent results obtained:

Bakeries inspected	130	Inspections made	908
Bottling Plants inspected	184	Inspections made	1,193
Creameries and Ice cream plants inspected	109	Inspections made	685
Total number of plants inspected	423	Total Inspections	2,786

The number of samples examined chemically or otherwise are as follows:

Foods and beverages for adulteration	1,934
Foods, beverages & other substances for poison	99
Drugs, etc. for poison, dope and other objectionable substances	49
Whiskey for medicinal purposes	14
Beverages, home brew, etc. for alcohol	57
Water for mineral and drinking purposes	64
Human viscera for poison	6
Contents of human stomachs for poison(One post mortem)	7
Animal viscera for poison	10
Kidney stone, composition of same	1
Lard colored in making	3
Linseed oil	76
Illuminating oil, official and unofficial	7,012
Lubricating oil for motor use, unofficial	136
Fuel oil, residence furnaces, unofficial	9
Gasoline, official and unofficial	21,384
Water and other substances for naturally occuring oils	27
Gasoline improvers or anti-knock substances	5
Anti-freeze mixtures	3
Sizing material for mill use	3
Paint substances	11
Miscellaneous	31
Total number of samples analyzed	30,941

Respectfully submitted

W. M. ALLEN
Chief of Division

BI-ENNIAL REPORT WEIGHTS & MEASURES
1929-1930

Hon. W. A. Graham, Commissioner
N. C. Department of Agriculture
Raleigh, N. C.

Dear Mr. Graham:

Complying with your request of recent date I take pleasure in making the following report of "Weights and Measures" activities for the past bi-ennial.

The law as amended and ratified March 16, 1929 necessitated the suspension of all active inspection work until July 1 or later as it was then illegal to collect fees, and the new method of financing was through the Revenue Department included in schedule "B" of the revenue act and not collectable prior to July 1, 1929. In August four inspectors were put on inspection duty, believing that the revenue would be ample to take care of these and more in the very near future. However, controversy arose as to the constitutionality of this franchise tax thereby necessitating a rather liberal interpretation by the Attorney General, Commissioner of Agriculture and Commissioner of Revenue. Therefore, the amount of revenue anticipated was greatly reduced and the enforcement of the "Weights and Measures Laws" was handicapped. Three of the four inspectors above mentioned were laid off in November, and the fourth in May 1930, at which time funds were completely exhausted. In July the work was resumed, revenue coming in on new fiscal year, and at present two inspectors are engaged in active work.

Regardless of handicaps and difficulties encountered records on file show that 13,102 inspections were made in 1929, and 11,720 to November 1, 1930, making a total for the bi-ennial of 24,822, viz:

6,512	Scales
3,536	Gasoline pumps
1,754	Kerosene pumps
3,925	Motor oil pumps
2,704	Weights
2,925	Liquid measures
407	Dry measures
3,040	Packages
19	Tank wagons
24,822	Total inspections
14	Cases prosecuted and convicted

There was sold or consumed in North Carolina last year (1928-1929 season) 536,984,236 lbs. of tobacco, 270,000,000 gallons of gasoline, 34,018,932 gallons of kerosene oil and 6,750,000 gallons of motor oil.

A check on tobacco warehouse scales this year disclosed that 90% of the scales were out of order and inaccurate on first inspection, and that 71% were wrong on second inspection, which were condemned and reserviced prior to opening of season. The average error on this 71% was 3% and over.

The records show on first inspection that:

44.3% of all gasoline pumps are short
62.4% of all kerosene pumps are short
81.1% of all motor oil pumps are short
54.3% of all scales

Now with these facts in hand I am able to estimate the annual loss to the public of North Carolina on just four commodities as a result of inadequate inspection.

536,984,236 lbs.	tobacco	71% scales short	$688,611.70
270,000,000 gals.	gasoline	44.3% pumps short	149,968.05
34,018,932 gals.	kerosene	62.4% pumps short	33,079.30
6,750,000 gals.	motor oil	81.1% pumps short	210,647.80
		Total	$1,082,306.85

I have no records at present from which to estimate losses due to defective or inaccurate weighing, measuring, or recording devices used as a means of determining the value to the producer, consumer, purchaser, or seller of groceries, meats, canned goods, creamery products, bakery products, grain, feed stuffs, cotton, coal, fertilizer, cotton goods, electric, gas, and water meter readings, freight bills, parcel post, express and telephone charges, and package goods.

It is interesting to compare the records of Wake county showing conditions "before and after" inspection:

1st inspection	3d inspection	
44.3%	22.4%	gasoline pumps condemned
62.4%	6.6%	kerosene pumps condemned
81.1%	1.4%	motor oil pumps condemned
54.3%	21.0%	scales

This means that prior to inspection the people of Wake county were losing annually $26,073.34 on the first three named commodities, and last year (3d inspection) $5,854.88 equal to a saving of $20,218.46 or 77.54% recouping of former losses as a result of effective inspection.

In conclusion I will mention a few cases as an insight to conditions existing in the State. Found gasoline pump giving three for five gallons, a cotton beam scale requiring 18 lbs. to break, that is, to move beam from falling to rising position, a tobacco scale off 15 lbs. on 1,000, on which 3,000,000 lbs. of tobacco was purchased last year which shorted the farmers of that community out of over $9,000.00, a coal scale set so that 1,600 lbs. weighed a ton, a special check on an electric light bill resulted in a refund to the consumer of over $55.00 on a $58.00 bill. An unexpected check on a grocery store resulted in dumping over 300 packages weighed up for Saturday's rush. A check on 400 boxes of "Babe Ruth" candy showed 33% were short. A check on a case of sausage from a meat packing plant showed the packages varying as much as 12 1/2% short. On washing powders a shortage of as much as 38%. A gasoline tank wagon rated at 600 gallons capacity would hold only 578. A recent check in one of the large cities of the State developed that 26 out of the first 28 gasoline pumps tested were condemned due to incorrect measure. The first 22 stores visited resulted in 32 scales being condemned or confiscated, and in another city the first week of inspection showed that 90% of grocery stores were violating the Federal and State "Net Weight" law, second week (having prosecuted and convicted four) showed packages to be legal. I mention the latter to show how quickly people "fall in line" when they know that the law is being enforced and actual inspection is going on in their community. I am confident that the "Inspection of Weights and Measures Law" is as important and far reaching in its benefits to the public of North Carolina as any piece of legislation that has been enacted in several years, and hope that the next legislature will make necessary provisions for its efficient enforcement.

Respectfully submitted

C. D. BAUCOM
State Inspector Weights & Measures.

BIENNIAL REPORT TO THE COMMISSIONER

Division of Statistics

A Review of The Farm Situation

The Harvest Season for the year 1930 finds North Carolina farmers facing a serious economic situation. This is emphasized by the fact that the ratio of prices received by farmers to the prices paid for necessities by them - in other words, the purchasing power of the farmers' products is only about 70 percent of what it was before the World War. This means that a unit of farm produce now buys less than half of the non-agricultural products that it did before the World War, the purchasing power of manufactured products showing 149 percent of the pre-war level. Small grains, cotton and tobacco show the lowest levels. Fruits and vegetables, as of October, showed the highest index number at 150 percent. Even livestock products are on a low basis.

The country as a whole is experiencing a bad agricultural year. The yields are low (due largely to drought conditions), while at the same time prices received are low. The surplus production of products is very spotted. Within given States, counties show dedidedly different conditions. For instance, in North Carolina, the Northern Piedmont and Mountain counties have experienced dry conditions, although not nearly as disastrous as were experienced in Virginia, Kentucky and Tennessee, due to light rains in August and September. Livestock production in this area was affected, due to the shortage of grains, hays and pastures.

The prospective crop yield for North Carolina, expressed as a percentage of the average during the past ten years, shows 99.3 percent, as compared with Virginia's 67 percent and South Carolina's 119 percent. Thus, it will be observed that it is easily reasonable that about half of our State experienced favorable conditions and about half less favorable. September and October showed an improvement of about 8 percent in the condition of crops over the August prospects. November indicated a further improvement.

Cotton showed a November condition of 65 percent of a full crop promise for North Carolina, or an estimate of 234 pounds yield per acre. This compares with a ten-year average of 60 percent condition and 255 pounds yield. The acreage was reduced about 10 percent from last year. Tobacco showed a final condition of 76 percent as compared with the ten-year average of 74. As a result of the gradual increase in acreage, the 1930 crop of 539,000,000 pounds is a decided record for the State.

It is worthy of mention to note that due to programs of the Governor and the Commissioner of Agriculture and to allied campaigns, the acreages of feed and food crops have been increased appreciably during the current year. This

particularly applies to corn, hays, vegetables and legumes. Shortages have occurred in cotton, peanuts and wheat. Favorable prices were received for fruits, due to the decreased numbers of producing trees.

The outlook for 1931 is still quite problematical. However, present conditions warrant certain shifts in crop acreages, looking to better diversification and safe farming practices. The probabilities are for decreased acreages in cotton and tobacco, with increases in small grains, hays, peanuts, fruits and vegetables. The farmers are satisfied that they need not expect to obtain good prices next year and consequently will probably plant the crops essential for the farm needs.

THE STATISTICAL DIVISION

This Division has experienced a very satisfactory biennial period in all features of its work. The demands for the economic information developed have steadily increased. One of the most favorable developments has been the official adoption of the Farm Forecaster by the Educational Department of the State in their agricultural instruction in High Schools. The reports of this Division are accepted as official also by the Agricultural Extension Service and other agricultural agencies.

The Farm Census is improved greatly by the development of a scientifically recognized checking system, warranting more dependable results for not only the future but for the correcting of past irregularities. The voluntary reporters have been increased for several of the classified lists, thereby resulting in improvement in the number and quality of reports. A research project has been started so as to keep pace with the Federal methods, as well as to warrant more consistent and reliable forecasts. The field investigations have been continued as best they could with the limited travel appropriation available, thus enabling the office to be in practical contact with actual conditions over the State which could not be appreciated in any other way. The basic information on acreages and yields have been improved by the collecting of check data from several sources in the case of each study.

We confidently believe that there is not another crop reporting office in the Southern States that can prepare and distribute information superior to that being done in North Carolina. This is a big compliment to the State Department of Agriculture and to the wise foresight of the Commissioner in encouraging the statistical type of farm economic information.

Respectfully submitted,

Frank Parker

Agricultural Statistician

October 29, 1930.

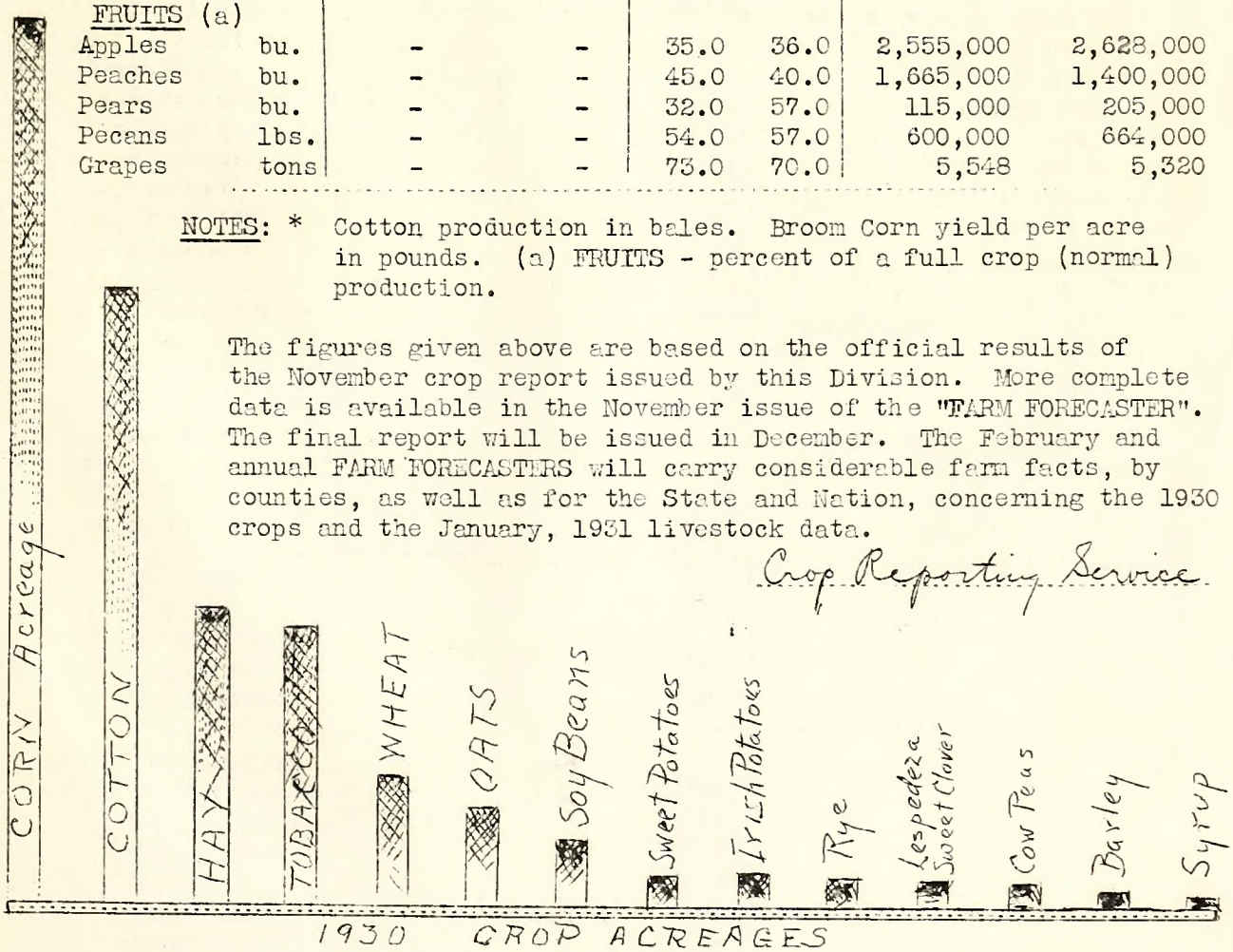
NORTH CAROLINA CROPS

Crops	Unit	Acreage 1930	Acreage 1929	YIELD PER ACRE 1930	YIELD PER ACRE 1929	PRODUCTION 1930	PRODUCTION 1929
Corn	bu.	2,462,000	2,259,000	20.5	21.5	50,471,000	48,568,000
Cotton	lbs.	1,715,000	1,878,000	234.0	190.0	840,000*	747,000*
Tobacco	lbs.	787,000	764,000	685.0	665.0	539,095,000	508,060,000
Peanuts	lbs.	233,000	220,000	850.0	1020.0	181,050,000	220,400,000
Wheat,winter	bu.	366,000	457,000	12.5	11.7	4,575,000	5,347,000
Oats	bu.	281,000	258,000	23.6	24.0	6,632,000	6,192,000
Rye	bu.	89,000	98,000	12.0	12.0	1,068,000	1,176,000
Barley	bu.	39,000	40,000	22.0	24.0	858,000	960,000
Potatoes, Irish	bu.	85,000	74,000	100.0	110.0	8,494,000	8,130,000
Potatoes, Sweet	bu.	90,000	78,000	95.0	117.0	8,550,000	9.126,000
Buckwheat	bu.	8,000	11,000	15.0	15.0	120,000	220,000
Hay, tame	tons	836,000	813,000	.85	.95	711,000	776,000
Soy Beans	bu.	194,000	162,000	9.0	12.0	1,746,000	1,944,000
Cowpeas	bu.	65,000	50,000	7.0	9.0	455,000	450,000
Velvet Beans	lbs.	15,000	14,000	1000.0	1300.0	15,000,000	18,200,000
Flax	bu.	4,500	-	9.0	-	40,500	-
Sorghum sirup	gals.	22,000	20,000	82.0	94.0	1,804,000	1,880,000
Sugar Cane	gals.	1,100	1,000	106.0	133.0	116,600	133,000
Broom Corn	tons	500	200	250.0*	325.0*	62	33
FRUITS (a)							
Apples	bu.	-	-	35.0	36.0	2,555,000	2,628,000
Peaches	bu.	-	-	45.0	40.0	1,665,000	1,400,000
Pears	bu.	-	-	32.0	57.0	115,000	205,000
Pecans	lbs.	-	-	54.0	57.0	600,000	664,000
Grapes	tons	-	-	73.0	70.0	5,548	5,320

NOTES: * Cotton production in bales. Broom Corn yield per acre in pounds. (a) FRUITS - percent of a full crop (normal) production.

The figures given above are based on the official results of the November crop report issued by this Division. More complete data is available in the November issue of the "FARM FORECASTER". The final report will be issued in December. The February and annual FARM FORECASTERS will carry considerable farm facts, by counties, as well as for the State and Nation, concerning the 1930 crops and the January, 1931 livestock data.

Crop Reporting Service



1930 CROP ACREAGES

Department of Agriculture
Statement of Disbursements
Fiscal Year Ended June 30, 1930

Administration		
Salaries & Wages	14334.55	
Supplies & Materials	8060.11	
Postage	1299.02	
Travel	1426.23	
Printing	4171.07	
Repairs	48.25	
General	140.60	
Equipment	338.28	
		29818.11
Inspection		
Salaries and Wages	9362.50	
Supplies & Materials	96.01	
Postage	449.72	
Travel	17297.54	
Printing	192.25	
		27398.02
Markets		
Salaries & Wages	15467.01	
Supplies & Materials	399.05	
Postage	988.35	
Travel	5741.64	
Printing	385.20	
Repairs	7.50	
General	1098.83	
Equipment	200.69	
		24288.27
s avings & Loan		
Salaries & Wages	3000.00	
Travel	1555.86	
		4555.86
Analytical		
Salaries & Wages	23594.50	
Supplies & Materials	1760.50	
Postage	509.67	
Travel	129.38	
Printing	485.41	
Repairs	69.15	
Equipment	1508.36	
		28056.97
Entomology		
Salaries & Wages	11258.70	
Supplies & Materials	473.70	
Postage	299.50	
Travel	5190.95	
Printing	530.06	
General	207.16	
Equipment	57.60	18017.67

Botany		
Salaries & Wages	11672.50	
Supplies & Materials	307.28	
Postage	243.99	
Travel	570.51	
Printing	299.90	
Repairs	34.20	
General	24.10	
Equipment	91.73	
		13244.21
Pure Food		
Salaries & Wages	6480.00	
Supplies & Materials	598.19	
Postage	159.27	
Travel	327.86	
Printing	56.95	
Repairs	46.50	
General	28.68	
Equipment	499.91	
		8197.36
Farm Forestry		
Salaries & Wages	1500.00	
Supplies & Materials	1.80	
Postage	20.66	
Travel	189.44	
General	8.75	
		1720.65
Crop Statistics		
Salaries & Wages	17441.01	
Supplies & Materials	439.50	
Postage	127.93	
Travel	1152.37	
Printing	2006.36	
Repairs	6.50	
General	72.17	
Equipment	186.65	
		21432.49
Museum		
Salaries & Wages	7087.85	
Supplies & Materials	1494.09	
Postage	70.60	
Travel	323.93	
Printing	164.90	
General	360.01	
Equipment	663.86	
		10165.24

Serum			
Salaries & Wages	...		
Supplies & Materials	799.43		
Postage	1364.42		
Travel	148.60		
General	75.67		
Serum to be resold	20824.03		
		23212.15	
Drainage			
Salaries & Wages	1912.48		
		1912.48	
Veterinary			
Salaries & Wages	15625.35		
Supplies & Materials	519.73		
Postage	249.27		
Travel	8636.39		
Printing	25.00		
General	46.23		
Equipment	100.00		
		25201.97	
Test Farms			
Salaries & Wages	63418.55		
Supplies & Materials	47105.22		
Postage	194.84		
Travel	4764.08		
Printing	35.78		
Insurance	132.00		
Equipment	4755.41		
New Land	1913.53		
		122319.41	
Miscellaneous			
State College	60000.00		
Custodial	7200.00		
Farmers Convention	300.00		
State Fair	638.22		
Seed Improvement	5000.00		
		73138.22	
Emergency			
Salaries & Wages	1500.00		
Travel	1330.81		
General	6635.33		
		9466.14	
			442145.22

Gasoline & Oil Division

Salaries & Wages	40000.00	
Supplies & Materials	147.38	
Postage	1793.30	
Travel	23630.30	
Printing	465.70	
General	140.00	
Equipment	586.82	
		66763.50

Weights & Measures Division

Salaries & Wages	2575.00	
Travel	1672.98	
Other	81.07	
		4329.05

Department of Agriculture
Statement of Receipts
Fiscal Year Ended June 30,1930

Fertilizer	251101.14
Cottonseed Meal	16580.00
Feed	58042.33
Seed Licenses	3050.00
Condimental Feed	560.00
Serum	23397.13
Costs	1986.70
Legumes	317.00
Linseed Oil	1085.05
Bleached Flour	13905.00
Bottling Plants	1770.00
Ice Cream	1425.00
Potato Inspection	18.50
Soybean Inspection	94.60
Insecticides	1861.61
Analyzing Stomachs	300.00
Test Farms	54321.42
Bakeries	1240.00
Chicken Tests	3373.29
Markets	301.57
Seed Tags	1810.37
Seed Tests	19.50
Permit Tags	671.59
Inspection Entomology	1523.56
Tobacco Work	764.42
Weights & Measures	50.00
Refunds	175.21
	439744.99
Interest on deposits	438.42
Balance July 1,1929	155602.26
Ttotal	595785.67

Gasoline Inspection

Gasoline Tax Stamps	688841.18

Oil Inspection

Oil Tax Stamps	85013.15